



## PCE-BPD-P

### Impulse counters and ratemeters

#### BIG PANEL DISPLAYS

*Big panel displays with impulse counter, ratemeter and periodmeter functions. Different formats available with 60 mm and 100 mm digit height, 4 and 6 digits, in red color. Sturdy metal housing, with full IP65 protection, designed for panel, wall or hanging mount. Versatile and configurable, accepts all types of impulse signals (NPN, PNP, Namur, TTL, inductive, mechanical, encoders, ...), provides excitation voltage to power the transducer, configurable fast access menu, 'on power up' function, password and 5 configurable brightness levels. Universal AC and DC power. Accepts up to 3 output and control options (relays, analog retransmission, Modbus RTU, transistor outputs, RS-485 ASCII, ...). Configuration from frontal keypad or remote keypad.*

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# 1. Large display PCE-BPD-P

## Big panel displays with impulse counter, ratemeter and periodmeter functions

Big panel displays for long distance reading, for industrial applications. Different formats available with 4 and 6 digits, with 60mm and 100m digit height. Front keypad to access the configuration menu, and optional remote keypad.

Instruments with 5 impulse counter modes (*see section 1.13.3*), 2 ratemeter modes (*see section 1.13.9*) and 1 periodmeter mode (*see section 1.13.9*).

Highly configurable, accepts all types of sensors (NPN, PNP, push-pull, Namur, inductive, pick-up, mechanical, TTL, CMOS, ...) including single and bidirectional encoder signals.

Reading from 999999 to -199999 (or 9999 to -1999 for 4 digit formats) with configurable decimal point, scalable reading with configurable multiplier (1 to 999999) and divider factors (1 to 999999). Includes internal pull-up and pull-down resistors, configurable trigger levels, detection by rising or falling edge, excitation voltage configurable from 5 Vdc to 18 Vdc.

Output and control options with 1, 2 and 3 relays, transistor outputs, controls for SSR relays, isolated analog outputs, communications in Modbus RTU, RS-485 ASCII and RS-232.

Sturdy metal housing with full IP65 protection. Internal connections by plug-in screw clamp terminals, and output through cable glands. Housing prepared for panel, wall and hanging mount.

- Configurable '**Fast access**' to selected functions with key 'UP' (▲) (*see section 1.13.17*)
- '**On power up**' for system protection on 'cold' start-up and control of alarm status (*see section 1.13.18*)
- '**FAST**' mode for fast counter applications (*see section 1.13.3*)
- '**SLOW**' mode for ratemeters applications at low frequencies (slow applications) (*see section 1.13.9*)
- Easy configuration for most usual sensors at the '**SnSr / Auto**' menu (*see section 1.13.14*)
- alarms with 1 or 2 setpoints, independent activation and deactivation delays, hysteresis, manual unlocking, ... (*see section 1.13.15*)

Multiple display filters, memory of maximum and minimum reading, password protection, 5 brightness levels.

### 1.1 How to use this manual

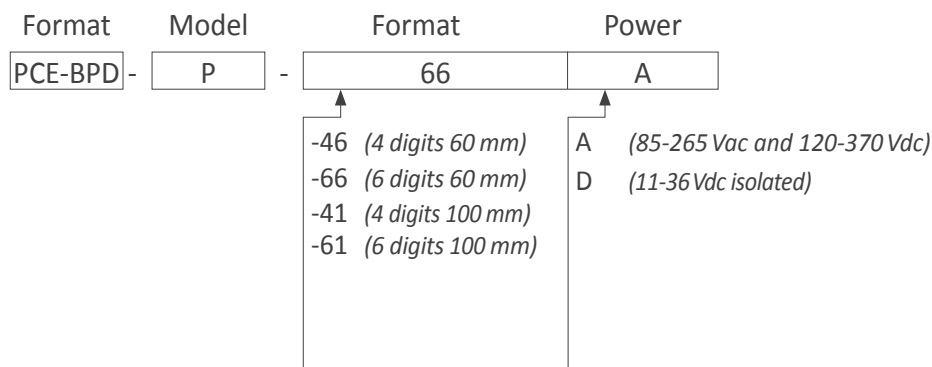
If this is the first time you are configuring big panel display, below are the steps to follow to install and configure the instrument. Read all the manual sections in order to have a

1. Identify the instrument format (*see section 1.4*)
2. Power and signal connections
  - open the instrument (*see section 1.5*)
  - connect the power (*see section 1.7*)
  - connect the signal (*see section 1.8*)
  - close the instrument (*see section 1.5*)
3. Configure the instrument (*see section 1.13*)
  - select the main function, and the decimal point position (*see section 1.13.2*)
  - configure the main function selected (*see section 1.13.2*)
    - counter modes from section 1.13.3
    - ratemeter and periodmeter from section 1.13.9
  - configure the sensor (*see section 1.13.13*)

full and clear view of the characteristics of the instrument. Do not forget to read the installation precautions at section 1.17.

4. Advanced configuration (optional)
  - configure the instrument alarms (*see section 1.13.15*)
  - configure the fast access (*see section 1.13.17*), 'on power up' (1.13.18), key 'LE' (1.13.19) and password (1.13.26)
5. If the instrument includes analog output or serial communications
  - to include an option to an instrument see section 1.6
  - to configure an installed option, access the option configuration menu (*see section 1.13.30*)
6. Install the instrument
  - mount on panel, wall or hanging (*see section 1.16*)
  - adjust the brightness level according to your environmental needs (*see section 1.13.29*)

## 1.2 How to order

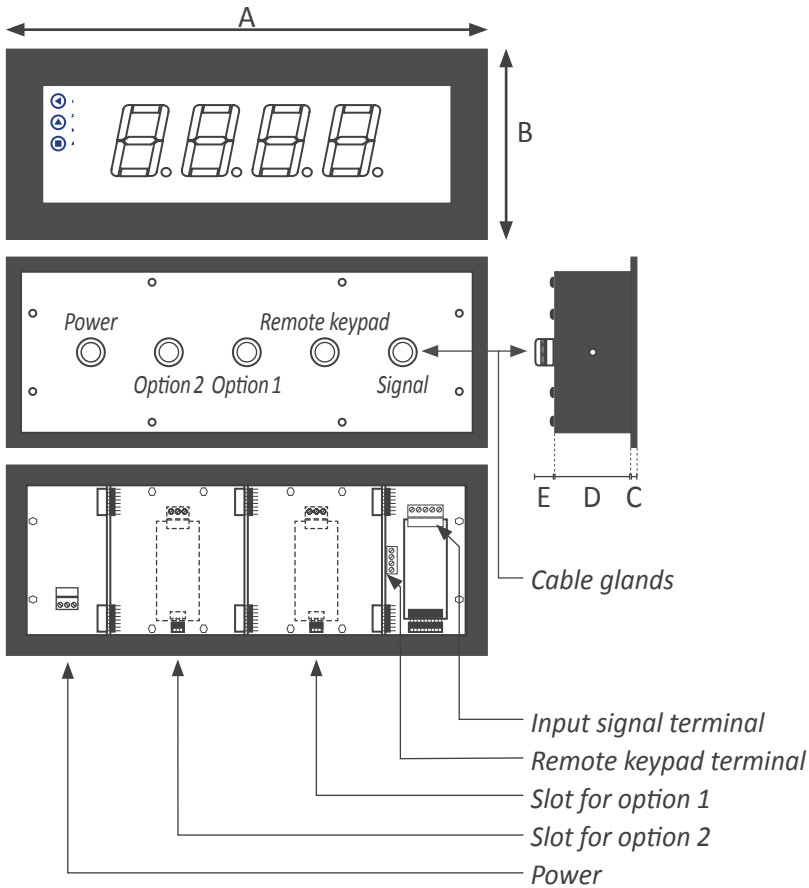


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## 1.4 Sizes and formats

### 1.4.1 Format 46

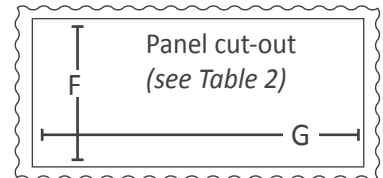


Size A	340 mm
Size B	135 mm
Size C	3 mm
Size D	55 mm
Size E	25 mm

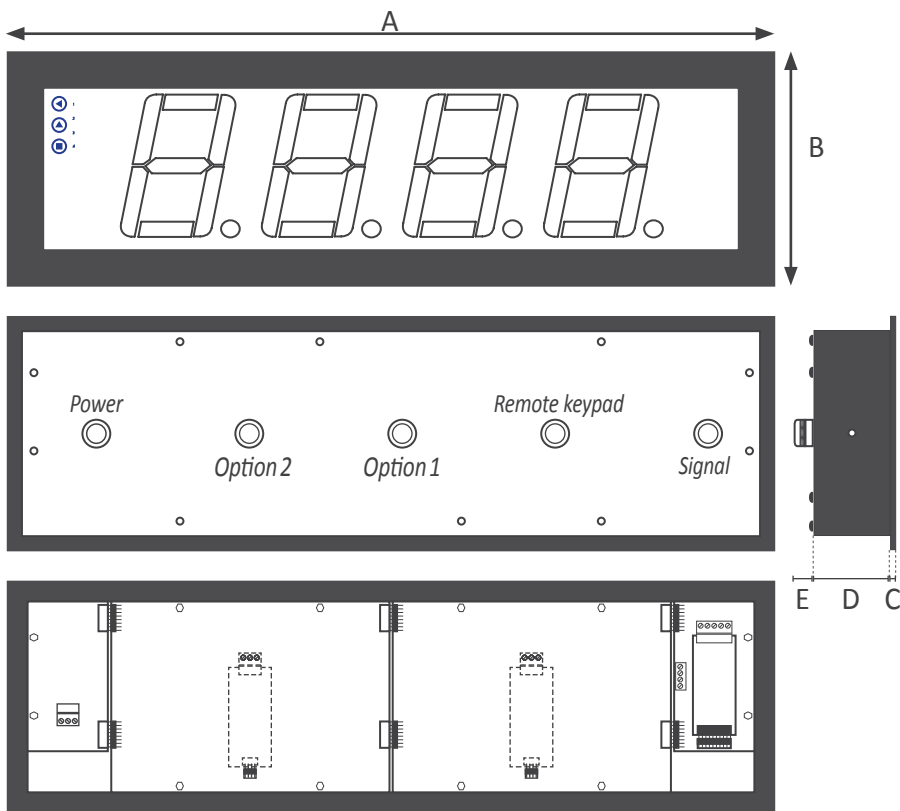
Table 1 - Sizes 46

Cut-out G	322 mm ( $\pm 1$ )
Cut-out F	117 mm ( $\pm 1$ )

Table 2 - Panel cut-out 46



### 1.4.2 Format 41

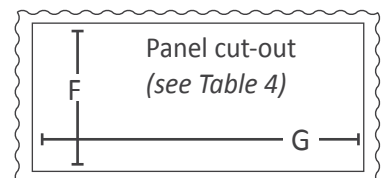


Size A	542 mm
Size B	166 mm
Size C	3 mm
Size D	55 mm
Size E	25 mm

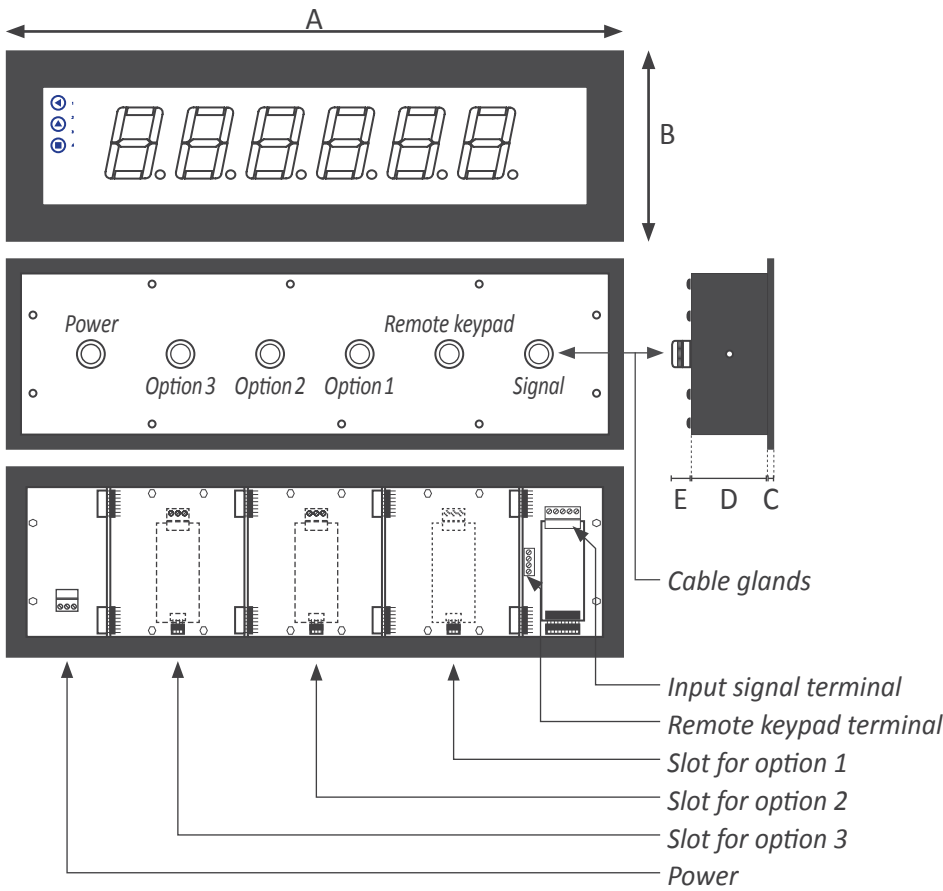
Table 3 - Sizes 41

Cut-out G	524 mm ( $\pm 1$ )
Cut-out F	148 mm ( $\pm 1$ )

Table 4 - Panel cut-out 41



### 1.4.3 Format 66

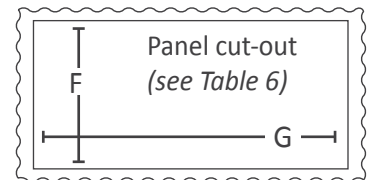


Size A	436 mm
Size B	135 mm
Size C	3 mm
Size D	55 mm
Size E	25 mm

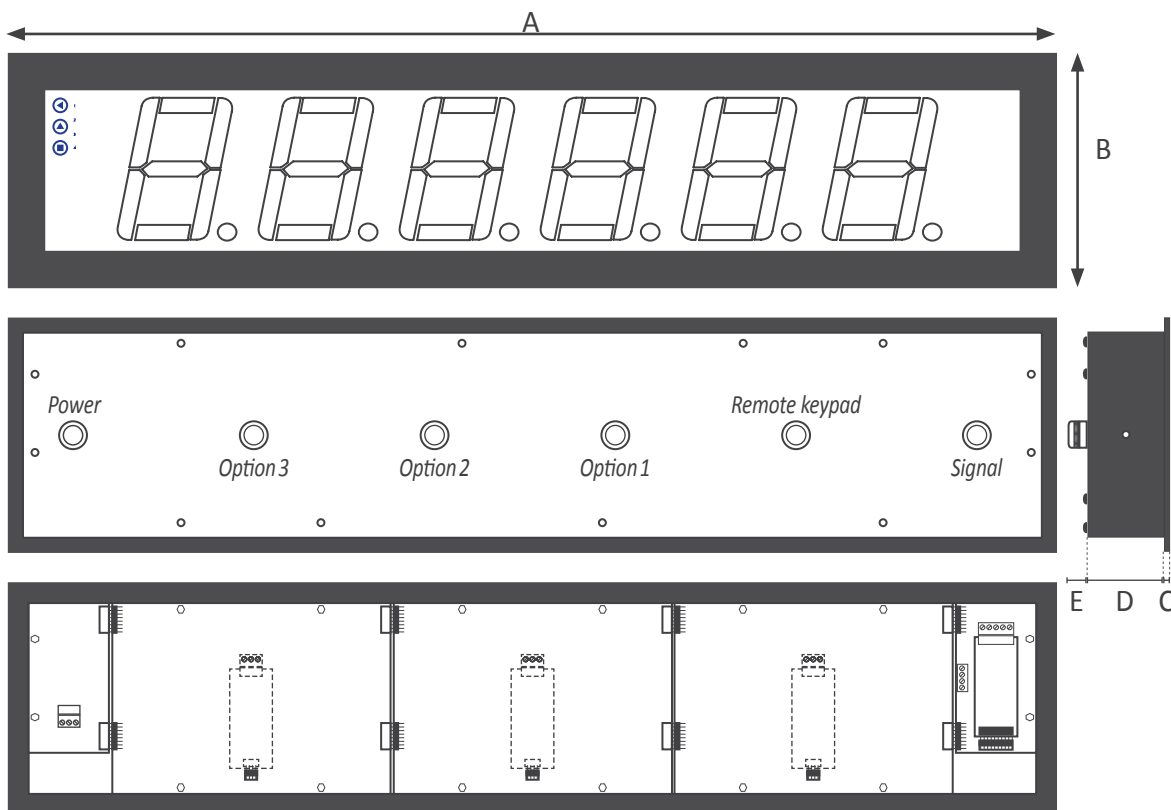
Table 5 - Sizes 66

Cut-out G	418 mm (±1)
Cut-out F	117 mm (±1)

Table 6 - Panel cut-out 66



### 1.4.4 Format 61

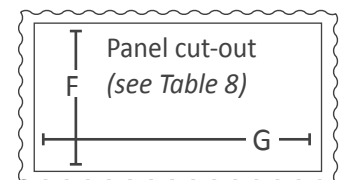


Size A	740 mm
Size B	166 mm
Size C	3 mm
Size D	55 mm
Size E	25 mm

Table 7 - Sizes 61

Cut-out G	722 mm (±1)
Cut-out F	148 mm (±1)

Table 8 - Panel cut-out 61



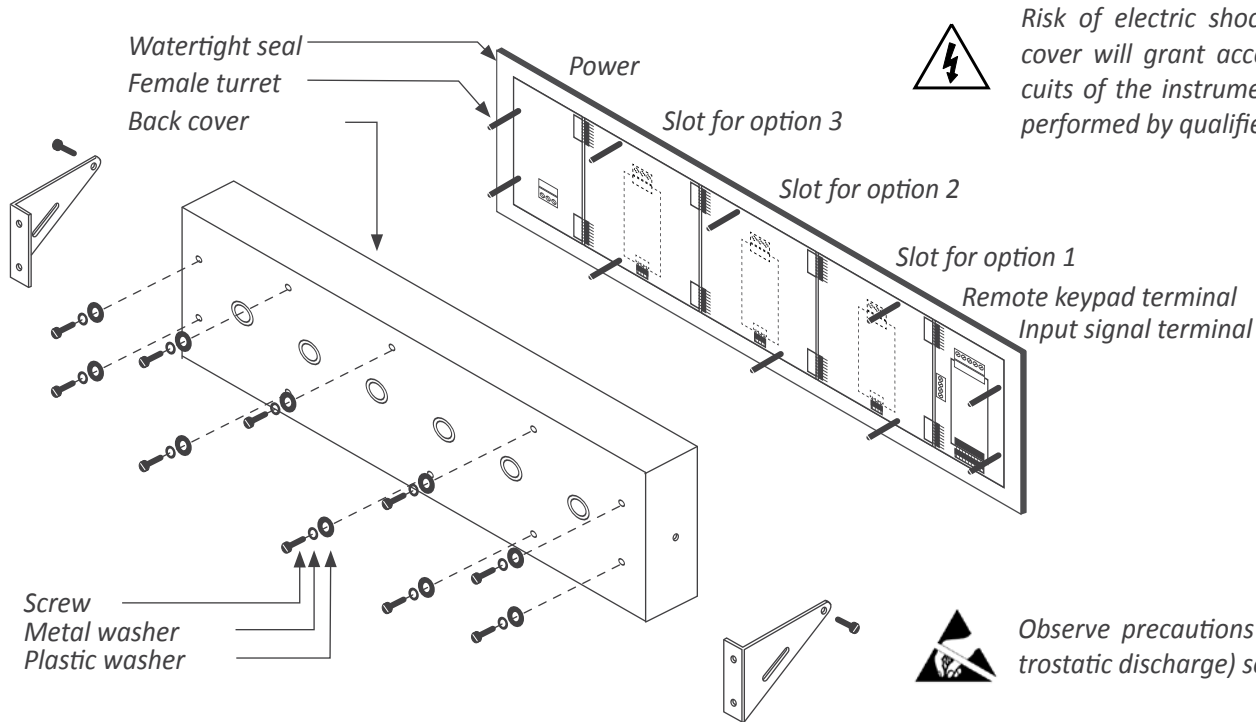
## 1.5 To access the instrument

To open the housing, remove the screws from the back cover. With each screw there is a metal washer and a plastic washer. Once the screws are out, remove the back cover.

The figure below shows the instrument internal structure for a 64 format. It shows the location of the 3 slots for optional output and control modules, the power terminal and the input signal terminal.

To close the instrument, place the back cover, the screws, the metal washer and the plastic washer. The plastic washer is in contact with the back cover. Confirm that the screws are correctly turning inside the internal female screws.

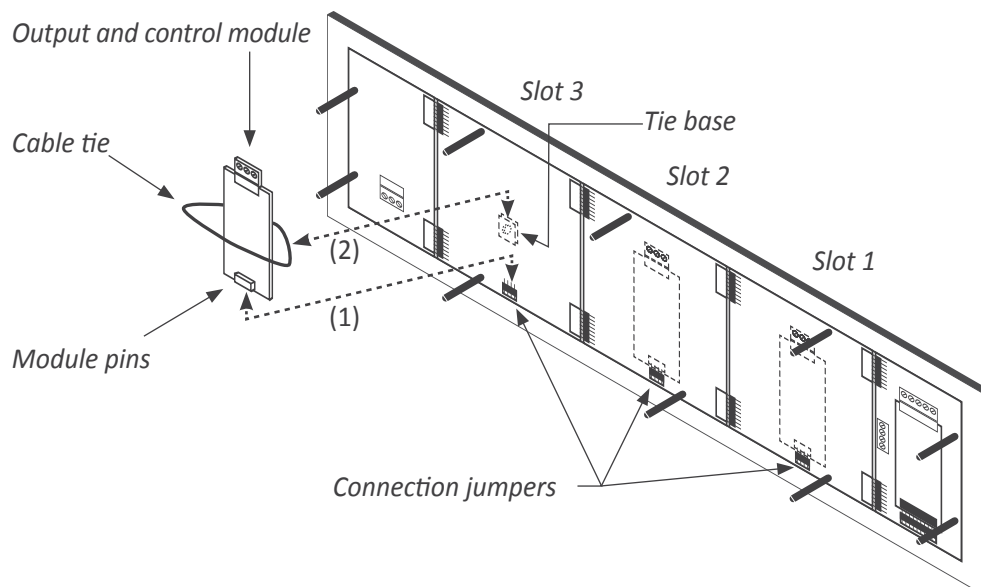
To ensure a correct IP65 protection tighten the back cover screws with a strength between 30 and 40 Ncm, with the help of a dynamometer screwdriver.



## 1.6 Modular system

Big panel displays are designed with an internal modular architecture. The output and control modules are independent and can be installed by accessing the internal circuits of the instrument, and connecting the module to the connection jumpers of the selected slot.

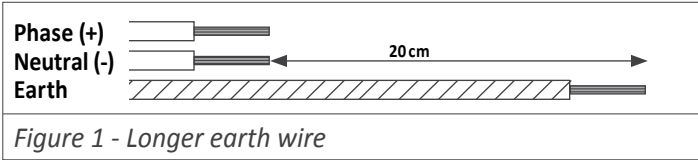
Each module is provided with a cable tie to fix the module to the tie base. The input signal modules defines the instrument function and are exchangeable, switching a temperature meter to an impulse counter only by replacing the input signal module.



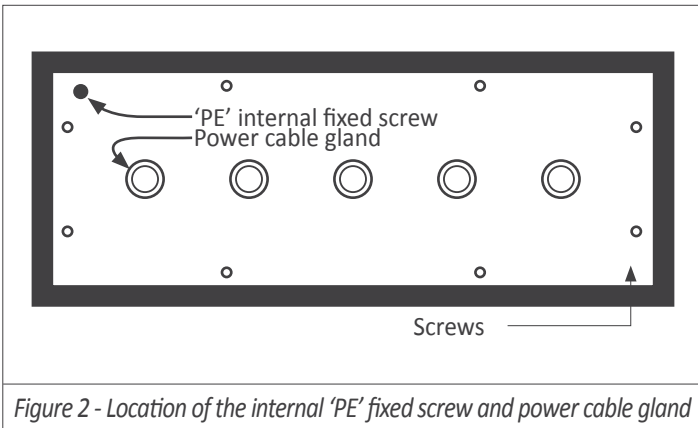
- To install an output and control module
- (1) insert the 'module pins' into the 'connection jumpers' in one of the free slots
  - (2) place the 'cable tie' into the 'tie base' and embrace the 'module' firmly, until it is fixed

## 1.7 Power connections and protective earth

1. Unscrew the screws from the back cover and remove the back cover (see section 1.5).
2. Pass the power cable through the power cable gland (see section 1.4).
3. Prepare the power cables so that the earth wire is 20 cm longer than the other cables (see Figure 1).

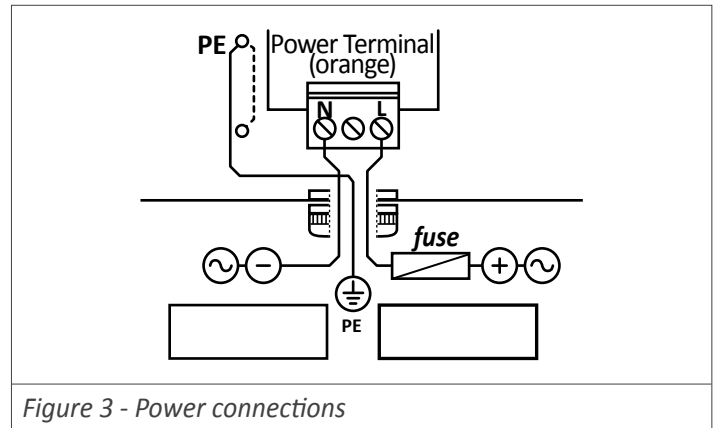


4. Connect the earth wire to the internal fixed screw 'PE' (see Figure 2) located at the inside of the back cover. The instrument internally connects the back cover metallic



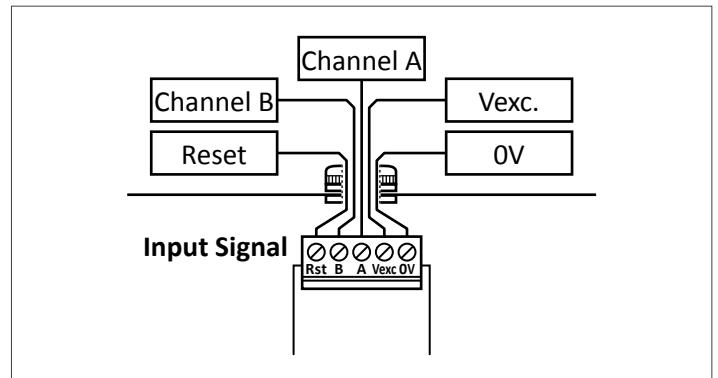
5. Connect phase and neutral (in AC power) or positive and negative (in DC power) to the internal power terminal.
6. The connections label attached to the outside of the instrument has some free space left to write the color or local code for each cable.
7. To comply with security regulation 61010-1, add to the power line a protection fuse acting as a disconnection element, easily accessible to the operator and identified as a protection device.

Power 'A'                      500 mA time-lag fuse  
 Power 'D'                      1000 mA time-lag fuse



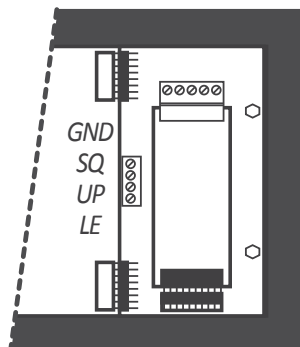
## 1.8 Input signal connections

1. Unscrew the screws from the back cover and remove the back cover (see section 1.5).
2. Locate the input signal terminal (see section 1.4).
3. Pass the signal cable through the signal cable gland (see section 1.4).
4. Connect the input signal cables (see Figure 4).
5. The connections label attached to the outside of the instrument has some free space left to write the color or local code for each cable.



## 1.9 Connections for remote keypad

The 4 pin terminal located beside the input signal module allows to replicate a remote version of the front keypad. Connect 4 cables for front keys 'SQ' (■), 'UP' (▲) and 'LE' (◀) and for the common. Pass these cables through the 'remote keypad' cable gland (see section 1.4).



Channel A	Input 'A' for impulses
Channel B	Input 'B' for impulses
Reset	Reset connection
Vexc	Excitation voltage
0V	Common

Figure 4 - Signal connections

## 1.10 Technical specifications

<b>Digits</b>		<b>Power</b>	
number of digits	4 or 6 (see Table 9)	power 'A'	85 to 265 Vac and 120 to 370 Vdc isolated (isolation 2500 Vac)
digit	7 segments	power 'D'	11 to 36 Vdc isolated (isolation 1500 Vdc)
view angle	120°	consumption	(see Table 9)
color	red	fuses	(see section 1.7)
digit height	(see Table 9)	wire section	max. 2.5 mm <sup>2</sup>
<b>Reading</b>		<b>Configuration</b>	
max., min.	(see Table 9)	front keypad with 3 keys	
decimal point	configurable	remote keypad (see section )	
overrange / underrange	configurable (flash, reset or pre-set) (see section 1.13.23)	<b>Output and control options</b>	
display refresh	15 refresh / second	relay output, analog retransmission, Modbus RTU, ...	
memory	yes, recovers the last counter value after power loss	<b>Mechanical</b>	
<b>Input signal</b>		IP protection	full IP65 housing
signals accepted	NPN, PNP, Namur, pick-up, TTL, inductive, mechanical, quadrature, ...	mounting	panel, wall , hanging (see section 1.16)
vdc max. at input	±30 Vdc	connections	cable gland outputs
input impedance	2.4 K with pull-up or pull-down 470 K without pull resistances	housing material	internal plug-in screw terminals textured iron, black painted methacrylate front filter (see Table 9)
frequency max./min.	for counter modes (see Table 12) for ratemeter modes (see Table 13) for periodmeter modes (see Table 13)	weight	(see section 1.4)
quartz accuracy	±0.01 %	front sizes	(see section 1.4)
thermal drift	20 ppm / °C	panel cut-out depth	(see section 1.4)
wires section	max. 0.5 mm <sup>2</sup>	<b>Temperature</b>	
<b>Excitation voltage</b>		operation	from 0 to +50 °C
output voltage	+18 Vdc, +15 Vdc, +9 Vdc, +5 Vdc selectable by menu	storage	from -20 to +70 °C
maximum current	70 mA	warm-up time	15 minutes
protection	yes, current limited to 70 mA		

	Format 46	Format 41	Format 66	Format 61
Number of digits	4	4	6	6
Digit height	60 mm	100 mm	60 mm	100 mm
Reading distance	25 meters	50 meters	25 meters	50 meters
Slots for output and control options	2	2	3	3
Maximum reading	9999		999999	
Minimum reading	-1999		-199999	
Consumption (without options installed)	3 W	5.25 W	3.5 W	5.5 W
Consumption (with options installed)	5 W	6.75 W	5,5 W	7 W
Weight	2200 gr.	2500 gr.	3500 gr.	4500 gr.

Table 9 - Technical specifications associated to format



### 1.11 Functions included

Counters	Mode	Frequency	Section
Counter	'FAST' mode	max. 250 KHz	1.13.3
	normal mode	max. 9 KHz	
Counter + inhibition		max. 9 KHz	
Counter + control Add / Subtract		max. 9 KHz	
Differential counter		max. 9 KHz	
Quadrature counter	mode x1	max. 17 KHz	
	mode x2	max. 16 KHz	
	mode x4	max. 11 KHz	

Table 12 - Maximum frequency for counter modes

Ratemeter	Mode	Frequency	Section
Ratemeter	normal mode	max. 500 KHz	1.13.9
	'SLOW' mode	max. 200 Hz min. 1 mHz	
Quadrature Ratemeter	mode x1	max. 17 KHz	
	mode x2	max. 16 KHz	
	mode x4	max. 11 KHz	

Table 13 - Maximum and minimum frequency for ratemeter modes

Periodmeter	Mode	Frequency	Section
Periodmeter	normal mode	max. 500KHz	1.13.9
	'SLOW' mode	max. 200Hz min. 1 mHz (1000 sec.)	

Table 14 - Maximum and minimum frequency for periodmeter modes

Functions included	Section
Fast access menu	yes, configurable 1.13.17
'SLOW' mode	yes, for slow frequencies 1.13.9
'FAST' mode	yes, for fast counting 1.13.3
Multiplier and divider	from 1 to 999999 1.13.3 1.13.9
Reset	configurable : front, external and linked to alarm 1.13.3 1.13.15 1.13.19
Preset	yes 1.13.3
Trigger level	configurable 1.13.13
Sensor selection	by menu 1.13.13
Cycle counter	yes 1.13.15
Retention memory	yes, recovers with power 1.10
'On Power Up'	yes 1.13.18
Excitation voltage	configurable 1.13.13
Average filter	recursive 1.13.3 1.13.9
Memory	max., min., cycles 1.13.17
Password	configuration locked 1.13.26
Alarms	simple or double setpoint activation delays deactivation delays hysteresis inverted relays locked alarms 1.13.15
Brightness	configurable, 5 levels 1.13.29

Table 10 - Functions included

### 1.12 Messages and errors

Error messages related to the local instrument are shown on display, in flash mode (see Table 11). Examples given are for instrument with 6 digit formats.

Messages and errors on display	
'Err.1'	incorrect password.
'Err.2'	at 'oPt.X' menu entry. Installed module is not recognized.
'Err.W'	'Watchdog' error
'999999'	+ flashing mode. Reading is in overrange.
'-199999'	+ flashing mode. Reading is in underrange.

Table 11 - Messages and error codes for local instrument

## 1.13 Configuration

### 1.13.1 How to operate the menus

The instrument has two menus accessible to the user :

'Configuration menu' (key 'SQ') (■)

'Fast access' menu (key 'UP') (▲)

#### Configuration menu

The 'configuration menu' modifies the configuration parameters to adapt the instrument to the application needs. To access the 'configuration menu' press for 1 second the 'SQ' (■) key. This access can be blocked by activating the 'Password' ('PASS') function. While operating the 'configuration menu', the alarm status is 'hold' to the status it had before accessing the menu, and the output and control modules remain in 'error' state. When leaving the 'configuration menu', the instrument applies a system reset, followed by a brief disconnection of the alarms and the output and control modules. Functionality is then recovered.

For a detailed explanation on the 'configuration menu' see the following sections, and for a full view of the 'configuration menu' see section 1.14.

#### 'Fast access' menu

The 'fast access' menu is an operator configurable menu, providing fast and direct access to the most usual functions of the instrument with a single key pad stroke. Press key 'UP' (▲) to access this menu.

See section 1.13.17 for a list of selectable functions for the 'fast access' menu in this instrument. The 'Password' ('PASS') function does not block access to this menu. Accessing and modifying parameters in the 'fast access' menu does not interfere with the normal functionality of the instrument, and it does not generate any system reset when validating the changes.

#### Operating with the front keypad inside the menus

**Key 'SQ' (■)** - press the 'SQ' (■) key for 1 second to access the 'configuration menu'. Inside the menu, the 'SQ' (■) key acts as an 'ENTER'. It enters into the menu option selected, and when entering a numerical value, it validates the number.

**Key 'UP' (▲)** - press the 'UP' (▲) key to access the 'fast access' menu. Inside the menu, the 'UP' (▲) key sequentially moves through the available parameters and menu entries. When entering a numerical value, it modifies the digit selected by increasing its value to 0, 1, 2, 3, 4, 5, 6, 7, 8, 9.

**Key 'LE' (◀)** - press the 'LE' (◀) key to activate the configured special functions associated to this key. Inside the menu, the 'LE' (▲) acts as an 'ESCAPE'. It leaves the selected menu level and eventually, by leaving all menu levels, it leaves from the configuration menu. Then changes are applied and the instrument is back to normal function. When entering a numerical value, it selects the active digit, and the value is then modified by key 'UP' (▲).

#### 'Rollback'

After 30 seconds without interaction from the operator, the instrument will rollback and leave the 'configuration menu' or the 'fast access' menu. All changes will be discarded.

#### Instruments with 4 and 6 digits

The configuration menus included in this document show values for a 6 digit instrument. In case of 4 digit instruments, note that maximum reading values should be 9999 instead of 999999 to 9999 and minimum reading values should be -1999 instead of -199999.

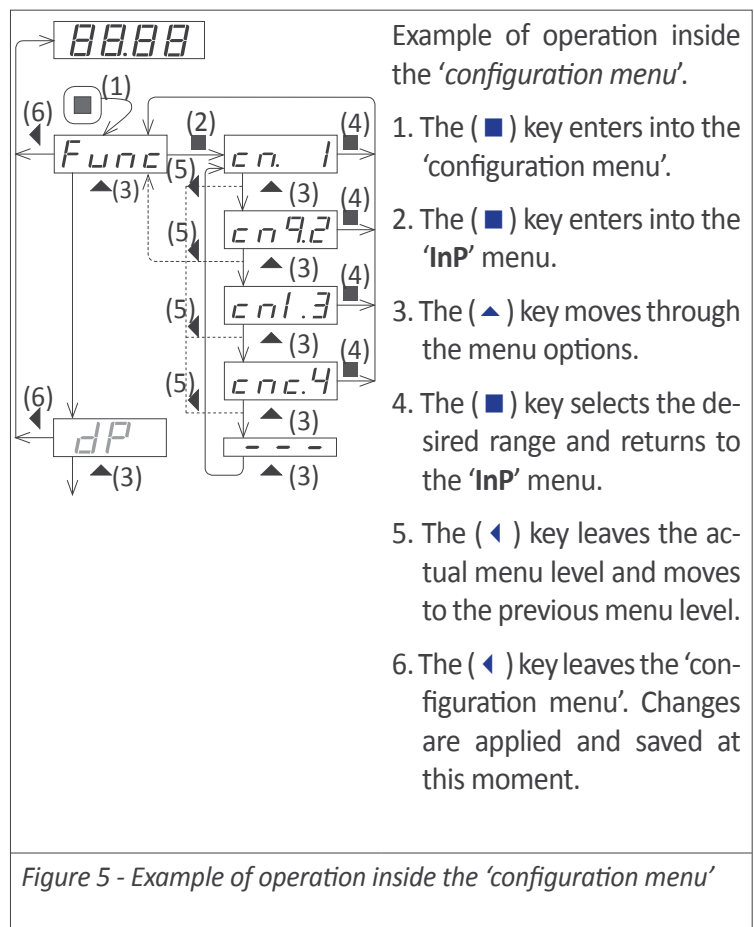
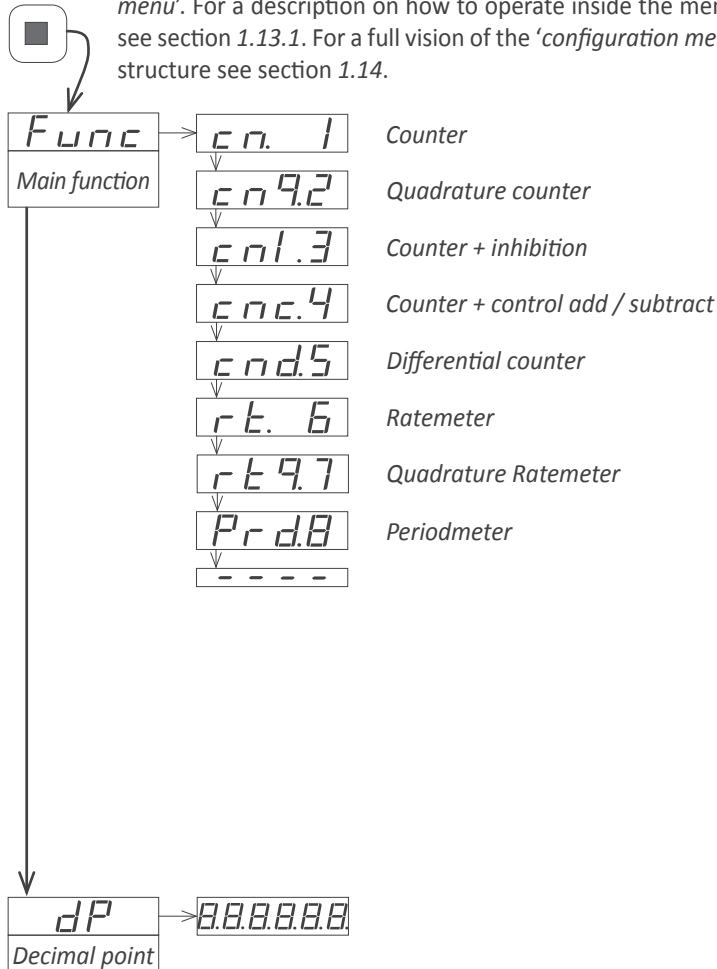


Figure 5 - Example of operation inside the 'configuration menu'

## 1.13.2 Initial set-up

Press 'SQ' (■) for 1 second to access the 'configuration menu'. For a description on how to operate inside the menus see section 1.13.1. For a full vision of the 'configuration menu' structure see section 1.14.



The next menu entry is the configuration parameters for the 'Main function' ('Func') selected. Configuration parameters are slightly different for each 'main function'. All possible configuration menus are explained, 'cnF.1' to 'cnF.7', one for each 'main function'. Only the configuration menu for the 'main function' selected is visible on the instrument.

To configure the initial set up, select the main function for the instrument, the decimal point position, configure the main function selected and configure the sensor.

Enter the 'Main function' ('Func') menu and select the desired function, from the 5 counting modes, 2 ratemeter modes and the periodmeter mode available.

- select 'Counter' ('cn. 1') for a standard impulse counter. Impulses are received at channel A. Channel B is disabled.
- select 'Counter quadrature' ('cnq.2') for a quadrature counter. Impulses are received at channel A and B, in quadrature format (typical for bidirectional encoders).
- select 'Counter + inhibition' ('cni.3') for a counter with an external control to inhibit the counting. Impulses are received at channel A. The state of channel B controls de inhibition function.
- select 'Counter + control add / subtract' ('cnc.4') for a counter with an external control to add or subtract impulses received. Impulses received at channel A. The state of channel B controls de add or subtract function.
- select 'Counter differential' ('cnd.5') for a counter where impulses received at channel A add and impulses received at channel B subtract.
- select 'Ratemeter' ('rt.6') for a standard ratemeter. Impulses are received at channel A. Channel B is disabled.
- select 'Ratemeter quadrature' ('rtq.7') for a quadrature ratemeter. Impulses are received at channel A and B, in quadrature format (typical for bidirectional encoders).
- select 'Periodmeter' ('Prd.8') for a standard periodmeter. Impulses are received at channel A. Channel B is disabled.

At the 'Decimal point' ('dP') parameter, select the decimal point position. Move the decimal point with the 'LE' (◀) key.

Configure the function mode selected ('cnF.2' to 'cnF.8') at the next menu entry ('cnF.1' to 'cnF.8'). See sections 1.13.3 to 1.13.12.

Configure the sensor at the 'SnSr' menu. See section 1.13.13.

### 1.13.3 Counter modes description

The instrument offers 5 selectable impulse counter modes. Each mode has 2 independent input channels 'A' and 'B'. Each impulse counter mode has a specific function assigned to channel 'B'.

- Standard counter ('cn.1') (see section 1.13.4) counts impulses received at channel 'A'. This counter has an optional 'FAST' mode to count high frequencies up to 250 KHz. The 'FAST' mode detects impulses on the rising edge of the impulse. The first edge received (rising or falling) after the instrument start up (after power loss or configuration change) will not be counted as a valid impulse, as it is needed for internal initialization.
- Quadrature counter ('cnq.2') (see section 1.13.5) counts quadrature impulses received at channels 'A' and 'B', (for example from a bidirectional encoder). The counter increases or decreases depending on the sense of turn of the encoder.
- Counter with inhibit ('cni.3') (see section 1.13.6) counts impulses received at channel 'A' if channel 'B' is inactive. Activate channel 'B' to inhibit the counting of impulses received

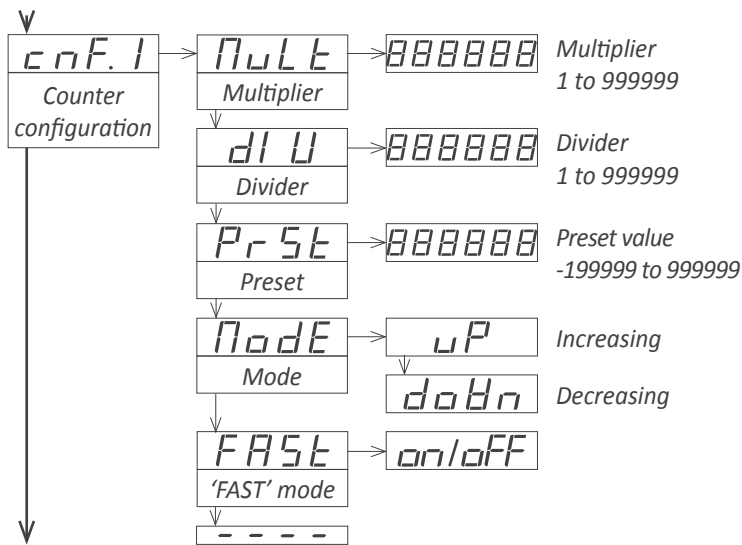
at channel 'A'.

- Counter with add/subtract control ('cnc.4') (see section 1.13.7) increases the counter with impulses received at channel 'A' if channel 'B' is active. Deactivate channel 'B' to decrease the counter with impulses received at channel 'A'.
- Differential counter ('cnd.5') (see section 1.13.8) increases the counter with impulses receive at channel 'A' and decreases the counter with impulses received at channel 'B'.

All counter modes have scalable reading through multiplier (1 to 999999) and divider (1 to 999999) parameters, configurable preset value (preset value loads on display when 'reset' function activates), configurable reset function and accessible from external terminal, front keypad or at alarm activation. Alarms with independent activation and deactivation delays and functions to load 'preset' or '0' to generate cycles of counting from 'preset' to 'alarm setpoint' and back. The number of cycles is accessible.

In case of power loss, the instrument recovers the last configuration and last counted value.

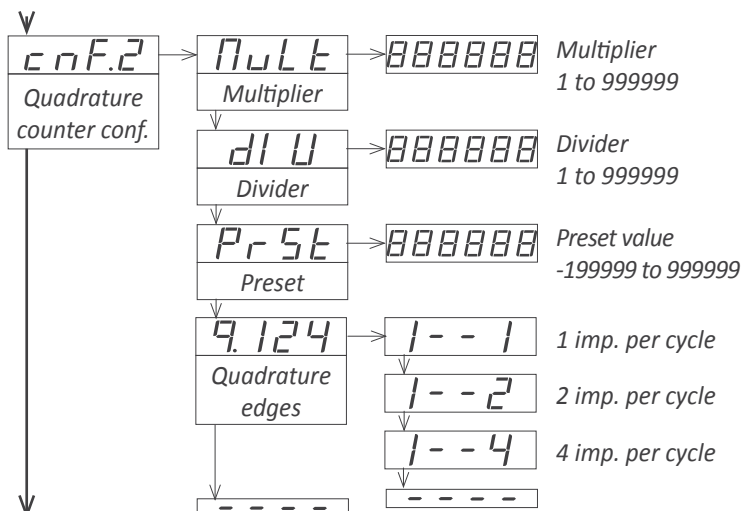
### 1.13.4 Standard counter 'cn.1' configuration menu



Configuration menu for mode 'counter' ('cn.1'). Total impulses received are multiplied by the value of the 'multiplier' ('Mult') parameter and divided by the 'divider' ('div') parameter. Result is shown on the display.

- set the 'Multiplier' ('Mult') parameter from 1 to 999999.
- set the 'Divider' ('div') parameter from 1 to 999999.
- set the 'Preset' ('PrSt') parameter from -199999 to 999999. Activate the reset to load the preset value on display.
- at the ('ModE') parameter select 'uP' to count upwards (impulses received add) or select 'doWn' to count downwards (impulses received subtract).
- at the 'FAST' ('FAST') parameter select 'on' to activate the fast mode. See section 1.13.3 for more information.

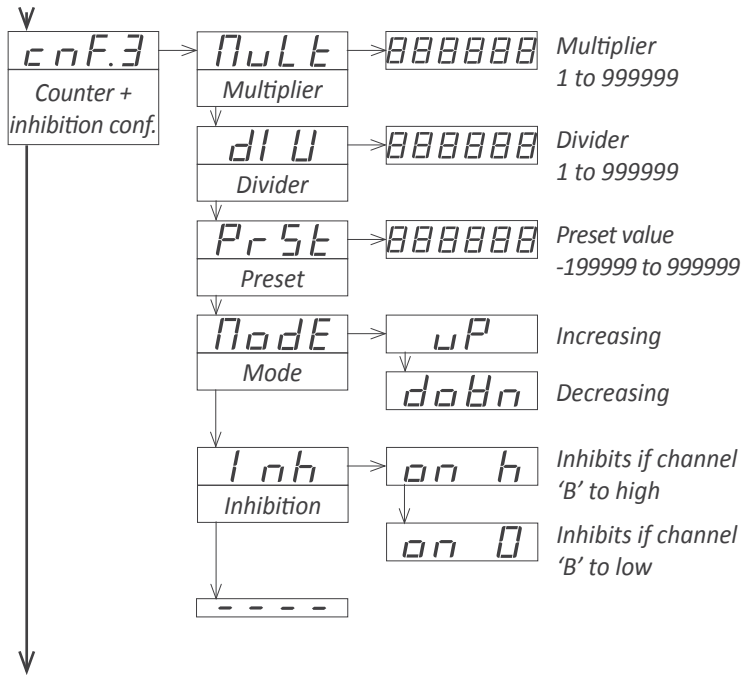
### 1.13.5 Quadrature counter 'cnq.2' configuration menu



Configuration menu for mode 'quadrature counter' ('cnq.2'). Total impulses received are multiplied by the value of the 'multiplier' ('Mult') parameter and divided by the 'divider' ('div') parameter. Result is shown on the display..

- set the 'Multiplier' ('Mult') parameter from 1 to 999999.
- set the 'Divider' ('div') parameter from 1 to 999999.
- set the 'Preset' ('PrSt') parameter from -199999 to 999999. Activate the reset to load the preset value on display.
- at the 'Quadrature edges' ('q.124') parameter select the number of edges to consider. Select '1--1' for 1 impulse per quadrature cycle, '1--2' for 2 impulses per quadrature cycle, '1--4' for 4 impulses per quadrature cycle.

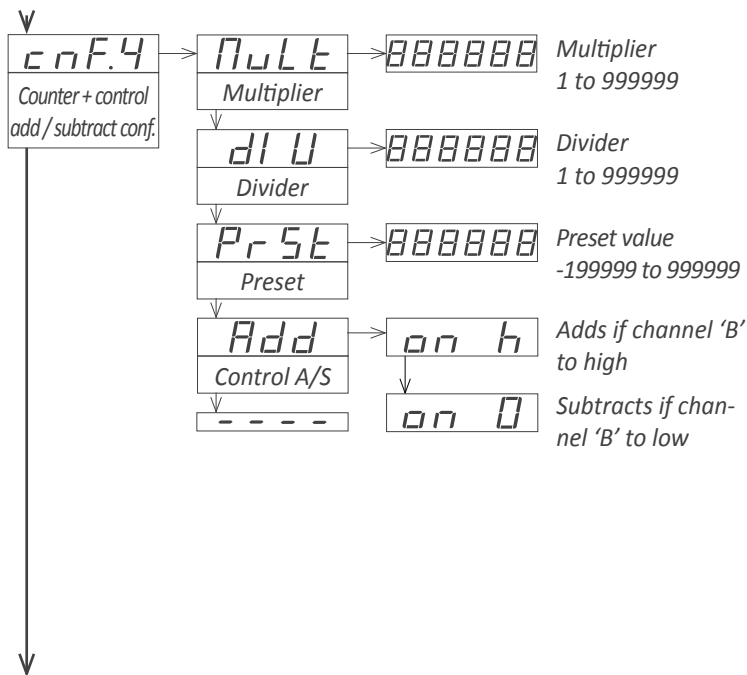
### 1.13.6 Counter + inhibition 'cn.3' configuration menu



Configuration menu for mode 'counter + control inhibition' ('cnl.3'). Total impulses received are multiplied by the value of the 'multiplier' ('MuLt') parameter and divided by the 'divider' ('dIV') parameter. Result is shown on the display.

- set the 'Multiplier' ('MuLt') parameter from 1 to 999999.
- set the 'Divider' ('dIV') parameter from 1 to 999999.
- set the 'Preset' ('PrSt') parameter from -199999 to 999999. Activate the reset to load the preset value on display.
- at the 'Mode' ('ModE') parameter select 'uP' to count upwards (impulses increase the counter) or select 'doWn' to count downwards (impulses decrease the counter).
- at the 'inhibition' ('Inh') parameter select 'on\_h' to inhibit the counter when channel 'B' is active (logical state '1') or select 'on\_0' to inhibit the counter when channel 'B' is inactive (logical state '0').

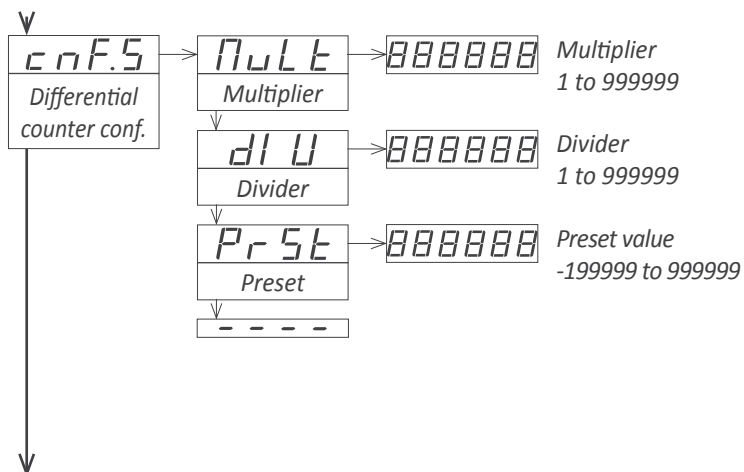
### 1.13.7 Counter + control add / subtract 'cnc.4' configuration menu



Configuration menu for mode 'counter + control add / subtract' ('cnc.4'). Total impulses received are multiplied by the value of the 'multiplier' ('MuLt') parameter and divided by the 'divider' ('dIV') parameter. Result is shown on the display.

- set the 'Multiplier' ('MuLt') parameter from 1 to 999999.
- set the 'Divider' ('dIV') parameter from 1 to 999999.
- set the 'Preset' ('PrSt') parameter from -199999 to 999999. Activate the reset to load the preset value on display.
- at the 'Control A/S' ('Add') parameter select 'on\_h' increase the counter with impulses received at channel 'A' when channel 'B' is active (logical state '1') or select 'on\_0' to decrease the counter with impulses received at channel 'A' when channel 'B' is inactive (logical state '0').

### 1.13.8 Differential counter 'cnd.5' configuration menu



Configuration menu for mode 'differential counter' ('cnd.5'). Total impulses received are multiplied by the value of the 'multiplier' ('MuLt') parameter and divided by the 'divider' ('dIV') parameter. Result is shown on the display.

- set the 'Multiplier' ('MuLt') parameter from 1 to 999999.
  - set the 'Divider' ('dIV') parameter from 1 to 999999.
  - set the 'Preset' ('PrSt') parameter from -199999 to 999999. Activate the reset to load the preset value on display.
- Impulses received on channel 'A' add to the counter. Impulses received on channel 'B' subtract from the counter.

### 1.13.9 Ratemeter and periodmeter modes description

The instrument offers 2 selectable ratemeter modes and 1 periodmeter mode. Ratemeters provide a reading proportional to the frequency measured, while reading at periodmeters is proportional to the time between impulses

- Standard ratemeter ('rt.6') (see section 1.13.10) to read speed values from impulse frequency signals.
- Quadrature ratemeter ('rtq.7') (see section 1.13.11) to read speed values and the turning sense of the axis, from two quadrature frequency signals, such as those provided by a bidirectional encoder. Speed is positive when the quadrature turns clockwise and negative when turns counterclockwise.
- Standard periodmeter ('Prd.8') (see section 1.13.12) to read time between impulses. For applications with long periods (long time between impulses) the 'SLOW' mode offers the best possible response time for each application.

All modes have scalable reading through multiplier (1 to 999999) and divider (1 to 999999) parameters, and a configurable time window ('GAtE') to adjust the measure refresh time.

#### • 'SLOW' mode

The 'SLOW' mode is an optional mode for very slow applications. Applies to ratemeter and periodmeter modes. The 'SLOW' mode accepts measures frequencies down to 1 mHz (0,001 Hz or 1000 seconds between impulses), and is functional up to 200 Hz.

The 'SLOW' mode offers the fastest response time for any given application, calculating the frequency and period values each time a new impulse is received.

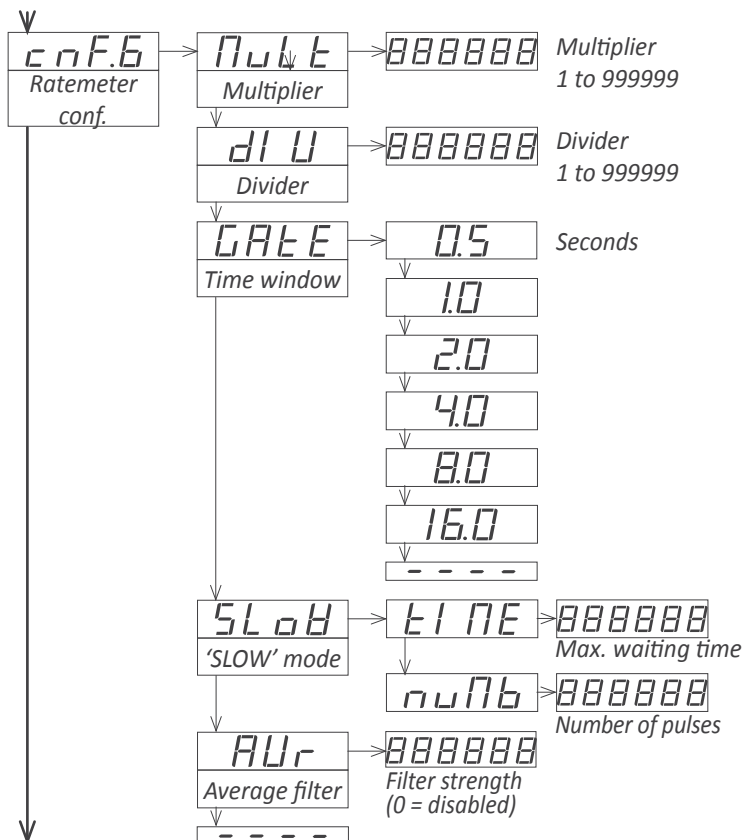
At the The 'Max. waiting time' parameter set a value between 1 and 1000 seconds. Select '0' to disable the 'SLOW' mode. If time between impulses is higher than the configured value, the instrument assumes that the signal has stopped and forces the reading to '0' (both in ratemeters and periodmeters). The 'GATE' parameter has no effect if the 'SLOW' mode is active.

At the The 'Number of pulses' parameter set a value between 1 and 32. This parameter defines the number of pulses that will be taken to calculate the period.

In 'Quadrature ratemeter' ('rtq.7') mode, the 'SLOW' mode calculates the frequency between two consecutive impulses received at channel 'A', and calculates the turning direction by comparing impulses at channel 'A' with the state of channel 'B'. The 'Quadrature edges' parameter is fixed to '1--1'.

*Application: to measure the speed of the propeller on ships, using two inductive sensors in quadrature, at low revolutions per minute.*

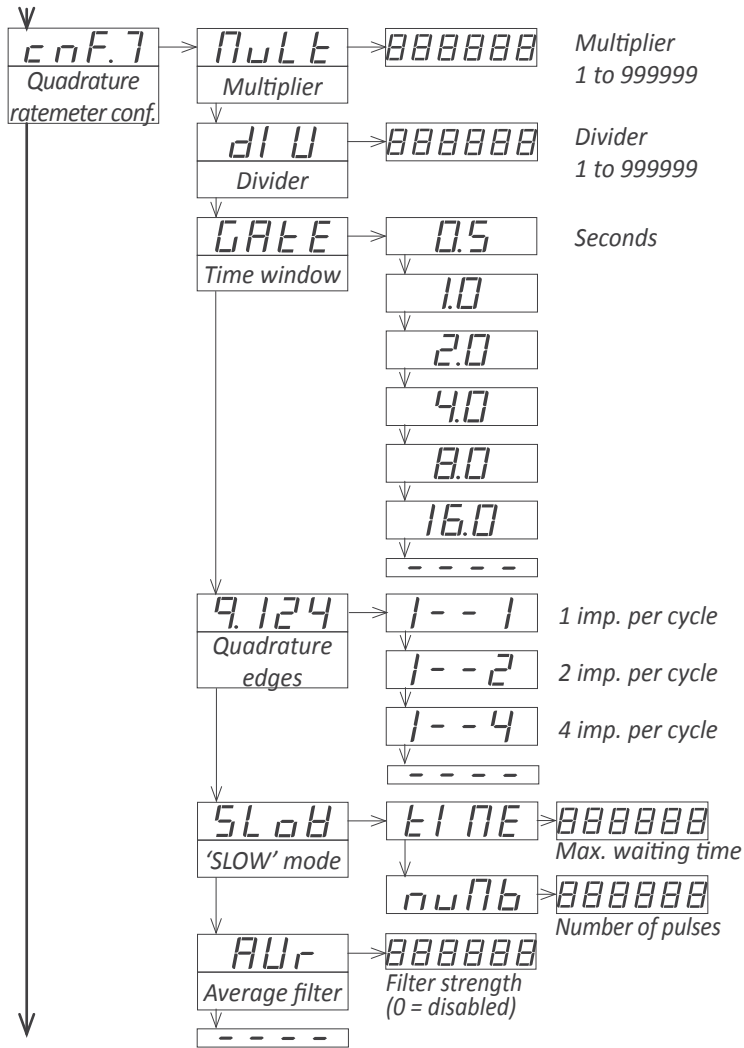
### 1.13.10 Ratemeter 'rt.6' configuration menu



Configuration menu for mode 'ratemeter' ('rt.6'). Measured frequency is multiplied by the value of the 'multiplier' ('Mult') parameter and divided by the 'divider' ('dIV') parameter. Result is shown on the display. The measure is updated on display as configured on the 'GAtE' parameter.

- set the 'Multiplier' ('Mult') parameter from 1 to 999999.
- set the 'Divider' ('dIV') parameter from 1 to 999999.
- select the 'Time window' ('GAtE') parameter at 0.5, 1.0, 2.0, 4.0, 8.0 or 16.0 seconds. This parameter defines how often the measure will be refreshed on display. This parameter has no effect if 'SLOW' mode is active.
- for slow frequencies activate the 'SLOW' parameter configuring the 'tIME' parameter between 1 and 1000 seconds. See 1.13.9 for more information. Configure the 'nuMb' parameter between 1 and 32 impulses.
- if reading is unstable, set the 'Average filter' ('AVr') parameter to 'on' to activate a recursive filter on the display, and configure the filter strength from 0.0 to 99.9. The filter is stronger for higher values. Strong filters make readings more stable and changes slower to update. Set '0' to disable the filter.

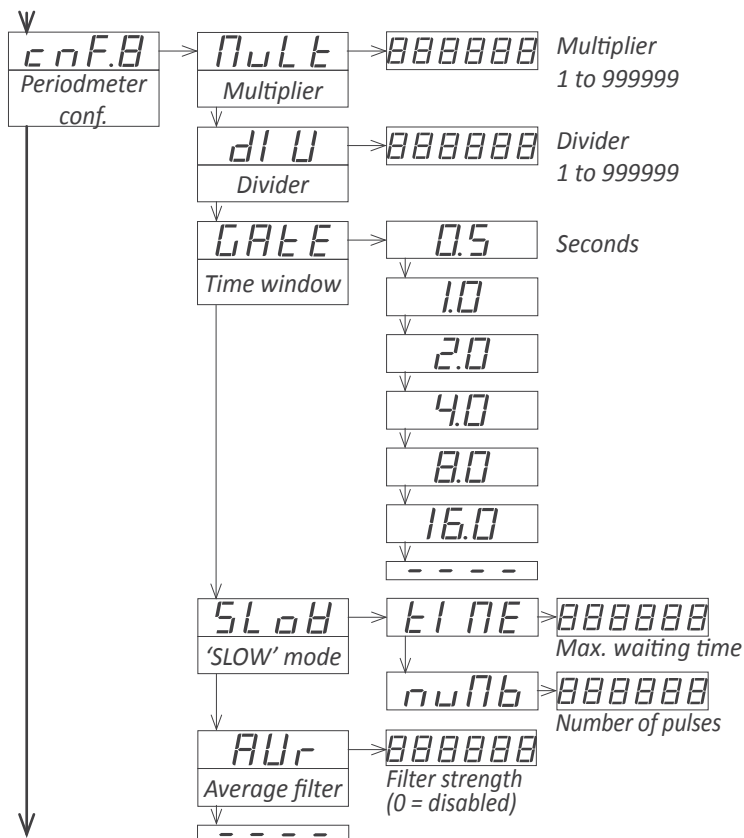
### 1.13.11 Quadrature ratemeter 'rtq.7' configuration menu



Configuration menu for mode 'quadrature ratemeter' ('rtq.7'). Measured frequency is multiplied by the value of the 'multiplier' ('Mult') parameter and divided by the 'divider' ('dIV') parameter. Result is shown on the display. The measure is updated on display as configured on the 'Gate' parameter.

- set the 'Multiplier' ('Mult') parameter from 1 to 999999.
- set the 'Divider' ('dIV') parameter from 1 to 999999.
- select the 'Time window' ('GAtE') parameter at 0.5, 1.0, 2.0, 4.0, 8.0 or 16.0 seconds. This parameter defines how often the measure will be refreshed on display. This parameter has no effect if 'SLOW' mode is active.
- at the 'Quadrature edges' ('q.124') parameter select the number of edges to consider. Select '1--1' for 1 impulse per quadrature cycle, '1--2' for 2 impulses per quadrature cycle, '1--4' for 4 impulses per quadrature cycle.
- for slow frequencies activate the 'SLoW' parameter configuring the 'tIME' parameter between 1 and 1000 seconds. See 1.13.9 for more information. Configure the 'nuMb' parameter between 1 and 32 impulses.
- if reading is unstable, set the 'Average filter' ('AVr') parameter to 'on' to activate a recursive filter on the display, and configure the filter strength from 0.0 to 99.9. The filter is stronger for higher values. Strong filters make readings more stable and changes slower to update. Set '0' to disable the filter.

### 1.13.12 Periodmeter 'Prd.8' configuration menu



Configuration menu for mode 'periodmeter' ('Prd.8'). Measured period is multiplied by the value of the 'multiplier' ('Mult') parameter and divided by the 'divider' ('dIV') parameter. Result is shown on the display. The measure is updated on display as configured on the 'Gate' parameter.

- set the 'Multiplier' ('Mult') parameter from 1 to 999999.
- set the 'Divider' ('dIV') parameter from 1 to 999999.
- select the 'Time window' ('GAtE') parameter at 0.5, 1.0, 2.0, 4.0, 8.0 or 16.0 seconds. This parameter defines how often the measure will be refreshed on display. This parameter has no effect if 'SLOW' mode is active.
- for slow frequencies activate the 'SLoW' parameter configuring the 'tIME' parameter between 1 and 1000 seconds. See 1.13.9 for more information. Configure the 'nuMb' parameter between 1 and 32 impulses.
- if reading is unstable, set the 'Average filter' ('AVr') parameter to 'on' to activate a recursive filter on the display, and configure the filter strength from 0.0 to 99.9. The filter is stronger for higher values. Strong filters make readings more stable and changes slower to update. Set '0' to disable the filter.

### 1.13.13 Accepted sensors and signals

The instrument accepts the usual sensors and impulse signals, and provides a list for the operator to choose his sensor. It also allows to configure a wide range of parameters to adapt the reading to other non usual sensors and signals.

The directly selectable sensors are:

- Mechanical contact (free potential contact)
- Namur
- NPN and PNP, 2 or 3 wires
- Push-pull
- TTL and CMOS
- Pickup
- AC voltage signals up to 30Vp (inductive)

The configurable parameters are:

- Pull-up/pull-down resistors can be enabled or disabled independently for channel 'A', channel 'B' and the reset channel.
- The trigger level can be manually configured to any value between 0.0V and 3.9V. While modifying the trigger level parameter (press 'UP' (▲) to increase, press 'LE' (◀) to decrease), the two segments to the left show the actual

state '1' or '0' for channels 'A' and 'B'. This information helps to easily identify the real trigger level. When the left segments switch from 'high' to 'low' means that the trigger level for channels 'A' and 'B' has been reached. The same trigger level applies to channels 'A', 'B' and reset.

- Activation by rising or falling edges can be configured. Channels 'A' and 'B' share the same configuration. Reset has its own independent configuration.
- Excitation voltage can be configured to 5V, 9V, 15V o 18V, or even power off the excitation voltage.
- An antirrebound filter is configurable, by setting a time between 0 and 1000mSeconds. When an impulse is received, the instrument inhibits the counting of new impulses for the time configured.

See *Table 15* below for a list of directly selectable sensors, the associated configuration parameters for each one and connections. Parameters can be later on modified through the configuration menu.

For signal connections and reset connections, see section 1.8.

Sensor	Connections (0 signal Vexc)	Pulls	Vexc.	Antirrebound filter	Trigger level
Mechanical contact	0V 'A'	pull-up	no	100 mSeg.	2,5 Vdc
Namur	'A' Vexc	pull-down	9 Vdc	no	3,0 Vdc
NPN 2 wires	0V 'A'	pull-up	18 Vdc	no	2,5 Vdc
NPN 3 wires	0V 'A' Vexc	pull-up	18 Vdc	no	2,5 Vdc
PNP 2 wires	0V 'A'	pull-down	18 Vdc	no	2,5 Vdc
PNP 3 wires	0V 'A' Vexc	pull-down	18 Vdc	no	2,5 Vdc
Push-pull	0V 'A' Vexc	no	18 Vdc	no	2,5 Vdc
TTL CMOS Pick-up	0V 'A'	no	5 Vdc	no	2,5 Vdc
AC<30 Vp Inductive	0V 'A'	no	no	no	0 Vdc

Table 15 - Parameters configured and connections for listed sensors. Channel 'B' applies the same connections as indicated for channel 'A'

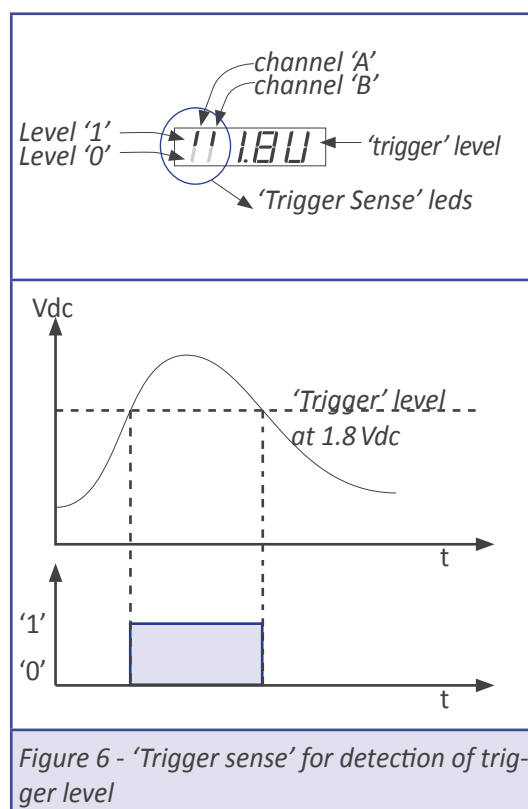
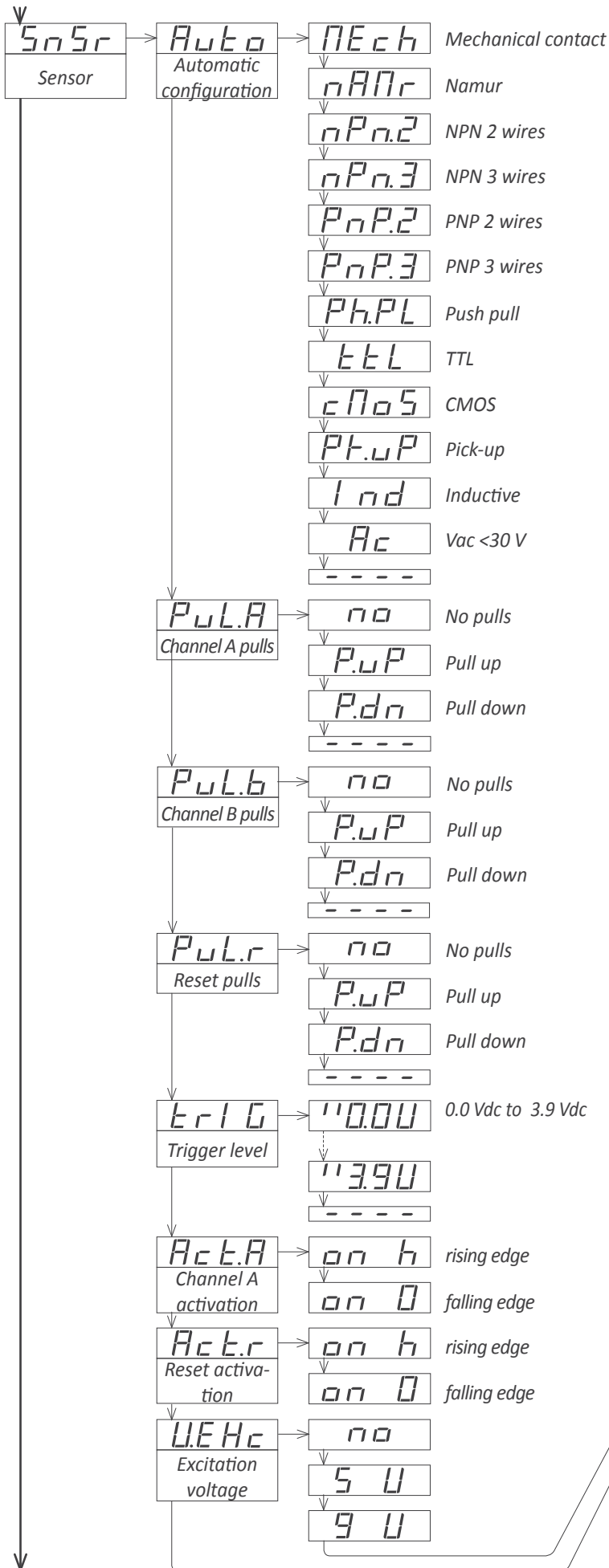


Figure 6 - 'Trigger sense' for detection of trigger level



### 1.13.14 Sensor configuration menu



The 'Sensor' ('SnSr') configuration menu contains all parameters related to the detection of the input signal, excitation voltage and trigger levels.

- enter the 'Automatic configuration' ('Auto') menu to select a standard sensor from the list. The instrument will configure the appropriate parameters for the sensor selected, as indicated at Table 15. If the instrument does not detect the signal with this configuration, the following parameters can be manually reconfigured.
- at 'Channel A pulls' ('PuL.A') select 'P.uP' to activate the internal pull-up resistors needed for NPN sensors, select 'P.dn' to activate the internal pull-down resistors needed for PNP sensors, or select 'no' to disable the pull resistors. Selecting pull-up or pull-down resistors sets the trigger level to 2,5 Vdc.
- at 'Channel B pulls' ('PuL.b') applies the same as previous entry but for channel B.
- 'Reset pulls' ('PuL.r') - applies the same as previous entry but for the reset channel.
- at 'Trigger level' ('trIG') configure the trigger level to detect the impulses. Signals levels above the trigger level are '1' signals, and signal levels below trigger level are '0' signals. Trigger level is selectable between 0,0 and 3,9 Vdc. Channels 'A' and 'B' share the same trigger level. Trigger level for reset channel is fixed at 2.5 Vdc. Vertical leds to the left are part of the 'trigger sense' utility to help locate the real trigger level for the actual signal. See section 1.13.13 for more information.
- at 'Channel A activation' ('Act.A') configure the activation of channel 'A' by rising edge ('on\_h') or falling edge ('on\_0')
- at 'Reset activation' ('Act.r') configure the activation of reset by rising edge ('on\_h') or falling edge ('on\_0')
- at 'Excitation voltage' ('V.Exc') configure the value for the excitation voltage to 5 Vdc, 9 Vdc, 15 Vdc or 18 Vdc. Select 'no' to disable the excitation voltage.
- at 'Antirrebound' ('rbnd') configure the filter that prevents mechanical rebounds to be accepted as real impulses. Configure a value between 0 and 1000 mSeconds. When an impulse is received, the instrument inhibits the counting of new impulses for the time configured. When time is over, the next impulse is accepted and the filter activates again. Recommended value is 100 mSeconds for a mechanical contact.

### 1.13.15 Alarms

The instrument manages 3 independent internal alarms, each one controlling the activation of an optional relay, transistor or control SSR output.

Optional modules are installed at the free slots inside the instrument (see section 1.4). Formats 46 and 41 have 2 free slots for output and control modules, while 64 and 61 formats have 3 free slots for output and control modules.

The instrument has 3 front leds that reflect the state of the 3 internal alarms. These leds are only for local help during installation, as they are not appropriate for long distance reading.

Each alarm controls the activation of the relay, transistor or control SSR installed on its associated slot, and the front led.

• **Configurable parameters**

Each alarm has several parameters for configuration, starting with the usual setpoint, hysteresis and maximum (alarm active when reading is higher than setpoint) or minimum (alarm active when reading is lower than minimum) alarm types (see Figure 7).

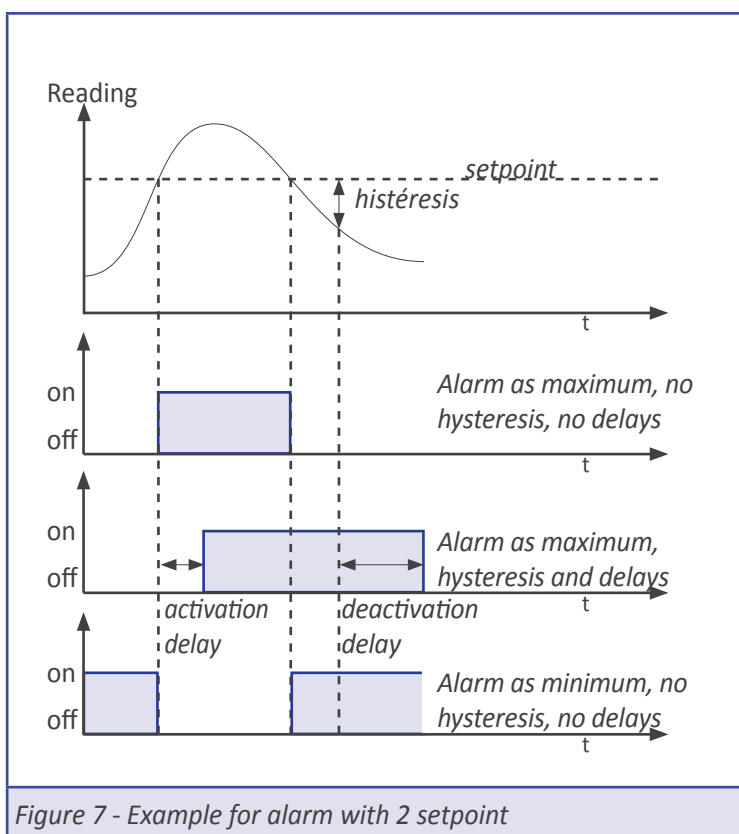


Figure 7 - Example for alarm with 2 setpoint

• **Activation and deactivation delays**

Each alarm can configure independent activation and deactivation delays. These delays affect the alarm as a whole, and the delay will affect the front led and the associated relay.

• **Second setpoint**

Configuring a second setpoint creates 'windowed alarms'. The windowed alarm controls with a single relay output if the reading is inside or outside the values defined (see Figure 8).

• **Inverted relay**

Activate the 'inverted relay' function to invert the activation logic of the associated relay.

• **'Locked alarms'**

Activate the 'locked alarms' function will force the operator to interact with the instrument when an alarm has been activated. Once activated, the alarm will remain locked at active state, even is the reading returns to a value below setpoint, until the operator manually unlocks the alarms pressing the front key 'LE' (or the remote key 'LE', see section ).

• **'On alarm' functions**

The 'on alarm' functions allow to associate a function to the alarm activation event. Functions available are reset to '0', load the preset value, or do nothing. Functions reset and preset create counting cycles (from 0, then to setpoint, then to 0 again, ...). The number of cycles performed can be accessed through the fast access menu (see section 1.13.17).

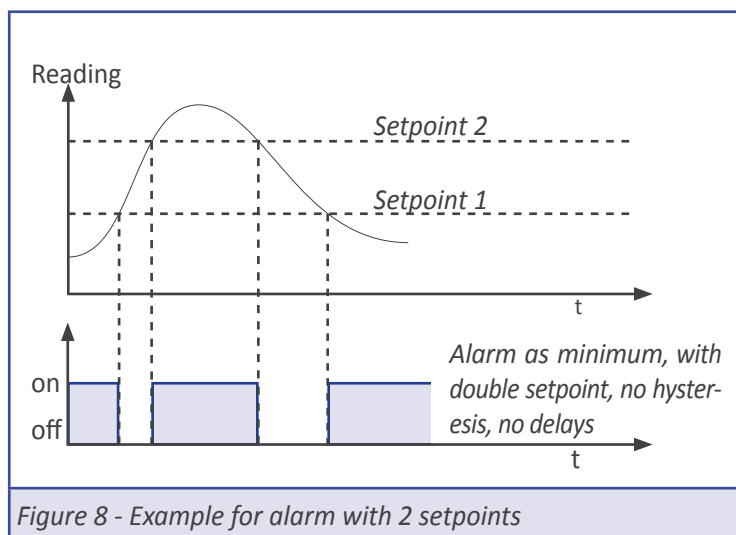
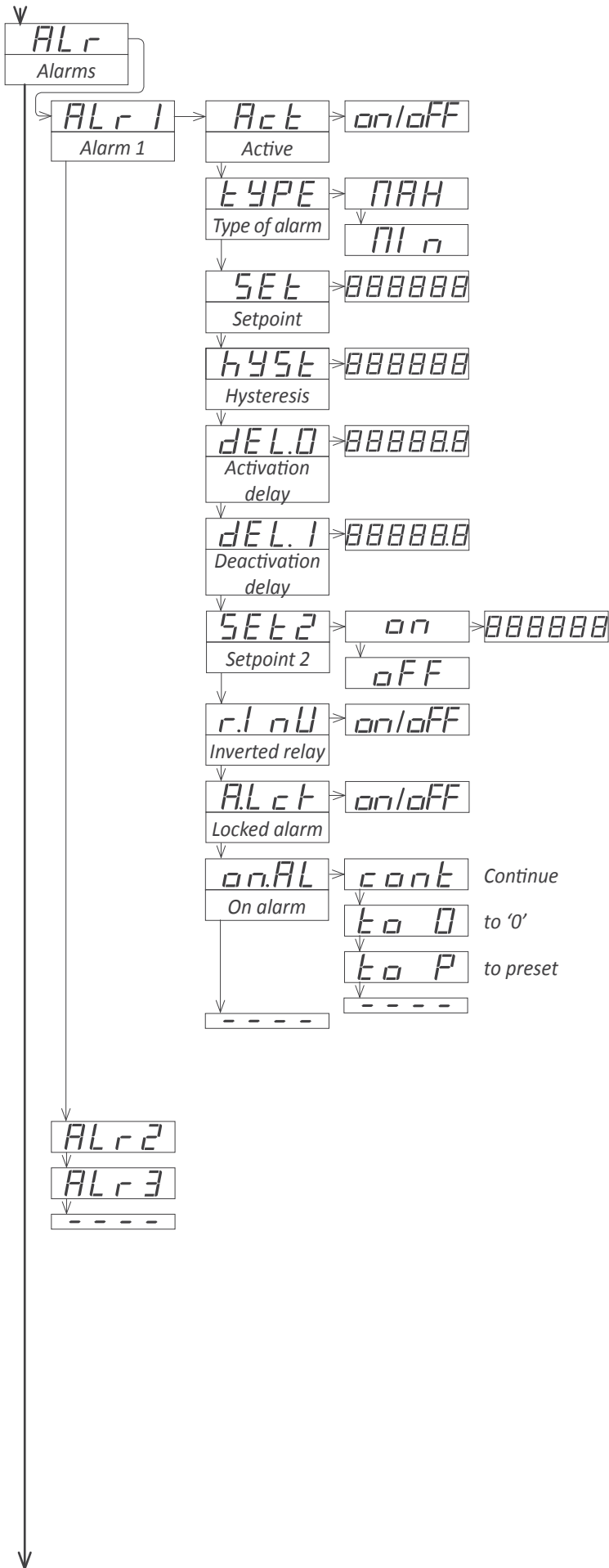


Figure 8 - Example for alarm with 2 setpoints

### 1.13.16 Alarms configuration menu



To configure the alarm, access the alarm menu ('ALr1', 'ALr2' or 'ALr3') and configure the following parameters :

- at the 'Active' ('Act') parameter select 'on'
- at the 'Type of alarm' ('Type') parameter select 'MAX' for maximum alarm (activates when reading is higher than setpoint), or 'Min' for minimum alarm (activates when reading is lower than setpoint).
- at the 'Setpoint' ('SEt') parameter configure the alarm activation point. Parameter value is accessible through 'fast access' (see section 1.13.17).
- at the 'Hysteresis' ('hySt') parameter select the hysteresis value. Hysteresis applies to the alarm deactivation. Alarm deactivates once the reading is beyond the setpoint plus the hysteresis value. Hysteresis prevents relay switching in case of signal fluctuations close to the setpoint value.
- at the 'Activation delay' ('dEL.0') parameter configure the delay to apply before the alarm is activated. Delay starts to count once the setpoint is reached. Value from 0.0 to 99.9 seconds.
- at the 'Deactivation delay' ('dEL.1') parameter configure the delay to apply before the alarm is deactivated. Delay starts to count once the setpoint is reached plus the hysteresis value. Value from 0.0 to 99.9 seconds.
- to work with 'windowed alarms' (see Figure 8) activate 'Setpoint 2' ('SEt2') to 'on' and then configure the desired second setpoint value. Second setpoint must always be higher in value than the first setpoint.
- at the 'Inverted relay' ('r.Inv') parameter select 'on' to invert the activation logic of the relay. Relay is inactive when alarm is active, and relay is active when alarm is inactive.
- at the 'Locked alarm' ('A.Lck') parameter select 'on' to block the automatic alarm deactivation. Alarm deactivation must be performed manually, by pressing the 'LE' front button (see section 1.13.19).
- at the 'On alarm' ('on.AL') parameter configure the action to activate when the alarm activates. Select 'cont' to do nothing and continue counting, select 'to\_0' to load a '0' on display, or select 'to\_p' to load the preset value on display. Selecting 'to\_0' or 'to\_p' configures 'dEL.1' to 1 second.

### 1.13.17 Fast access

The *'fast access'* is an operator configurable menu. The operator can access this menu with a single press of the front key 'UP' (▲). The configured menu entries will be accessible. Eligible parameters to be accessed by this menu are:

- access to the alarm setpoints through the 'UP' (▲) key allows to read and modify the values.
- access to the maximum and minimum alarms through the 'UP' (▲) key allows to read and reset the values. To reset the memory values: visualize the value on display, press the 'UP' (▲) key, when the 'rSt' message appears, press 'SQ' (■). The instrument will return to the memory visualization. Press the 'LE' (◀) key to exit his menu.
- access to the preset value to read and modify the value.

The *'fast access'* menu is not affected by the password function. This means that the configuration menu can be password blocked, while some configured functions or parameters can still be accessible to the operator through the *'fast access'* menu.

- **Super fast access**

If only a single function is selected for the *'fast access'* menu, pressing the the 'UP' (▲) key will shortly display the function name and then automatically jump to the function value.

### 1.13.18 'On power up' function

The **'On Power Up'** (**'on.Pu'**) functions allows to define a series of actions to activate when the instrument restarts after a power loss. Functions available are a delay so the instrument waits a defined time before starting to measure and control, and an automatic reset of the counter. The functions will apply only after a restart due to power-loss, they will not apply after a restart due to changes in configuration.

Delaying the measure and control functions gives additional time to elements of the system who are slower, so they can start completely before the instrument begins to acquire signal and control the outputs.

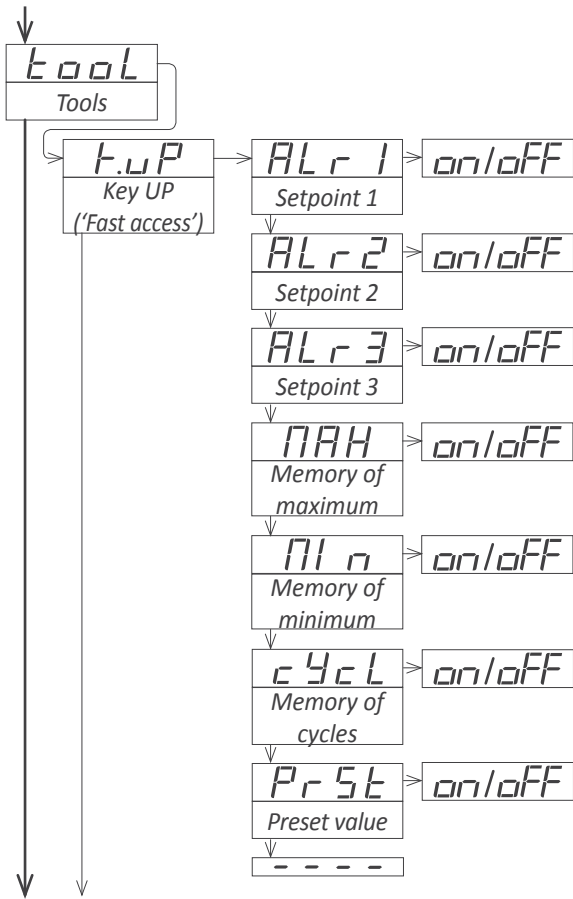
While on delay mode, the instrument shows all decimal points lightened and flashing, all alarms are deactivated, and there is no signal acquisition or communications control. When the delay time is over, the instrument starts its normal functioning.

### 1.13.19 Key 'LE'

The 'LE' (◀) key at the front of the instrument can be configured to activate several functions. Only one function can be assigned to the 'LE' (◀) key. Eligible functions are reset of the counter and the alarm unlock function (see section 1.13.15).

*Example: an impulse counter activates alarm 1 when reading reaches 153.000. Automatically the instrument activates a reset, reading goes to '0', and relay 1 is activated to inform that the required level has been reached. Counter remains at 0 receives several additional impulses, related to the system not stopping immediately. When the operator arrives, reloads the system and presses key 'LE' to return the reading to '0', unlocks the alarm and restarts the system.*

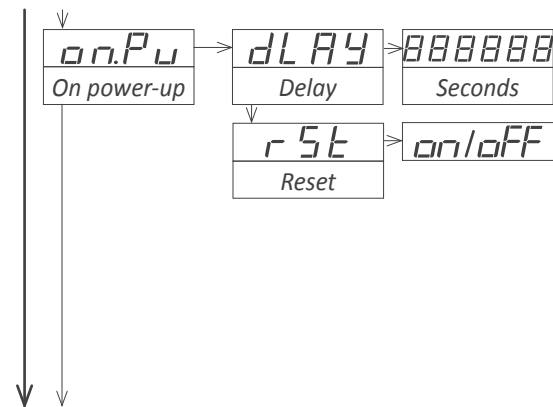
### 1.13.20 'Fast access' configuration menu



At the 'Key UP ('fast access')' ('K.uP') menu configure which functions and parameters will be accessible through the 'fast access' menu. Select 'on' to activate each function. For more information see section 1.13.17.

- the 'Setpoint 1' ('ALr1') function allows to visualize and modify the alarm 1 setpoint through the 'fast access' menu.
- the 'Setpoint 2' ('ALr2') function allows to visualize and modify the alarm 2 setpoint through the 'fast access' menu.
- the 'Setpoint 3' ('ALr3') function allows to visualize and modify the alarm 3 setpoint through the 'fast access' menu.
- the 'Memory of maximum' ('MAX') or 'Memory of minimum' ('Min') functions allow to visualize the maximum or minimum reading value stored in memory.
- the 'Memory of cycles' ('cYcL') function allows to visualize the number of cycles value stored in memory. The cycles value increases '+1' with each reset or preset associated to the alarm activation or resets associated to 'overrange' / 'underrange'.
- the 'Preset value' ('PrSt') function allows to visualize and modify the preset value through the 'fast access' menu.

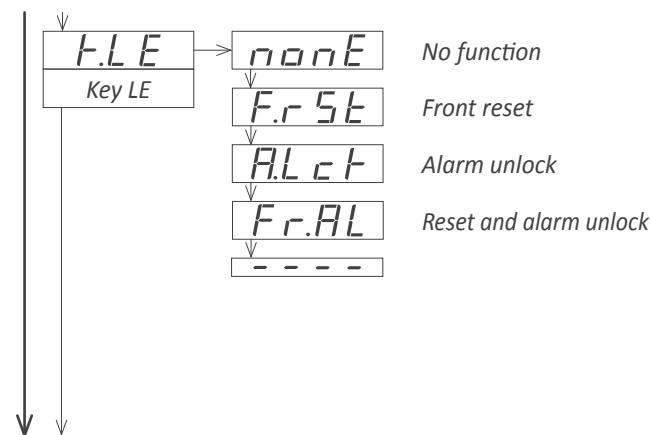
### 1.13.21 'On power up' configuration menu



The 'On Power Up' ('on.Pu') menu assigns functions to be applied when the instrument starts after a power loss. For more information see section 1.13.18.

- at the 'Delay' ('dLAY') parameter configure the time the instrument will wait before starting normal functionality. Time between 0 and 200 seconds.
- at the 'Reset' ('rSt') parameter set to 'on' to activate a reset when restarting after a power loss

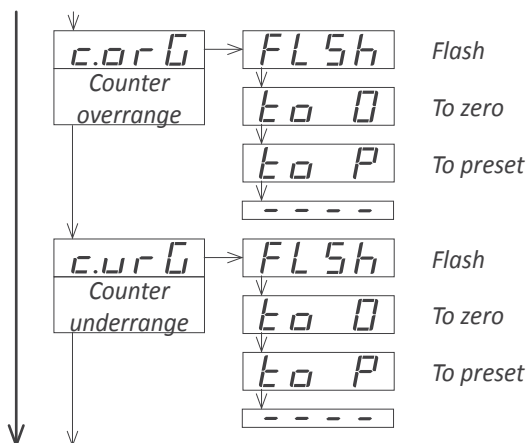
### 1.13.22 'Key LE' configuration menu



The 'LE' (◀) key at the front of the instrument can be configured to activate several functions. For more information see section 1.13.19.

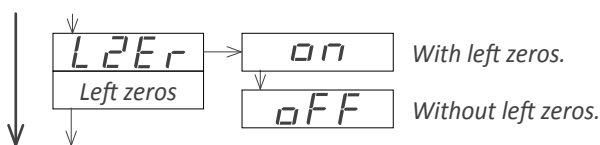
- the 'No function' ('nonE') value assigns no function.
- the 'Front reset' ('FrSt') value assigns the reset function.
- the 'Alarm unlock' ('A.Lck') value assigns the manual alarm unlocking, when the 'Locked alarms' ('A.Lck') function is active.
- the 'Reset and alarm unlock' ('Fr.AL') value assigns both functions at the same key..

### 1.13.23 'Overrange / underrange' function



The 'Counter overrange' ('c.orG') and 'Counter underrange' ('c.urG') parameters configure the behavior of the instrument when reading is higher than '999999' (overrange) or lower than '-199999' (underrange). Select 'FLSH' to enter reading into flash mode. Select 'to\_0' to apply a reset to '0'. Select 'to\_P' to apply a reset to preset value.

### 1.13.24 Left zeros function



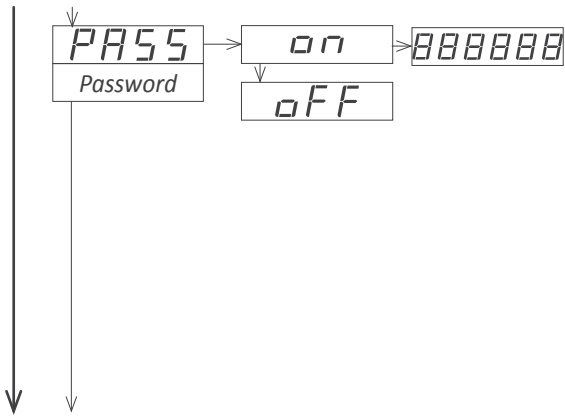
The 'Left zeros' ('L.ZEr') parameter controls the left zeros on or off.

### 1.13.25 Excitation voltage function



At the 'Vexc control' ('V.ctr') parameter select 'on' to activate the 'Err.8' message, when consumption requested to the excitation voltage is higher than the current the instrument can provide.

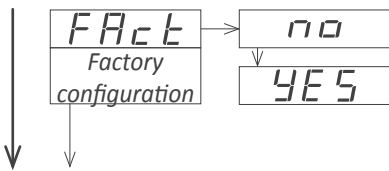
### 1.13.26 'Password' function



The password function blocks access to the configuration menu. The 'fast access' menu is not affected by the password function. This means that the configuration menu can be password blocked, while some configured functions or parameters (setpoint values, preset value, ...) can still be accessible to the operator through the 'fast access' menu.

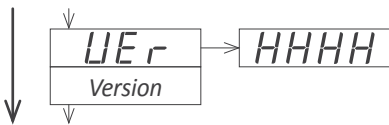
To activate the 'Password' function select 'on' and introduce the 6 digits code. The code will be requested when trying to access the 'configuration menu' (front key 'SQ' (■)).

### 1.13.27 Default factory configuration



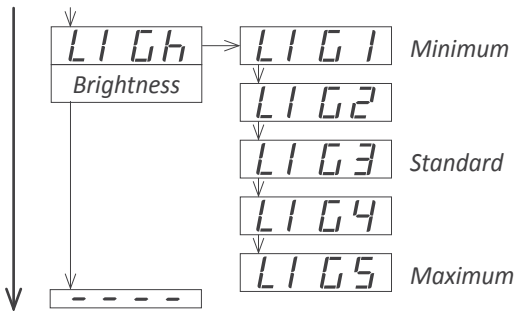
At the 'FACTORY configuration' ('FACT') menu select 'yes' to activate the default factory configuration. See section 1.15 for a list of default parameters.

### 1.13.28 Firmware version



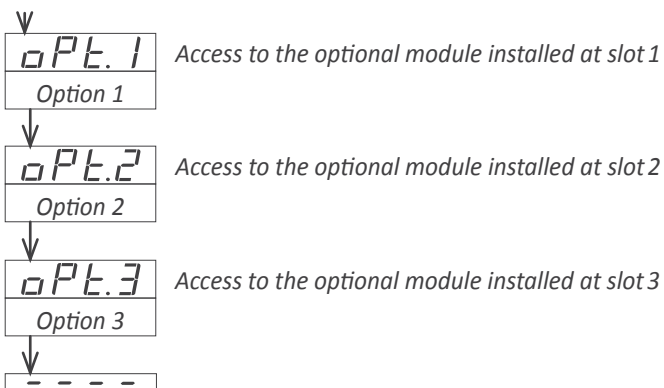
The 'Version' ('VER') menu informs about the firmware version installed on the instrument.

### 1.13.29 Brightness configuration



At the 'Brightness' ('LIGH') menu select the intensity level for the display. Use this function to adapt the brightness to match other instruments in the vicinity or to the darkness or clarity of your environment.

### 1.13.30 Access to the options configuration menu



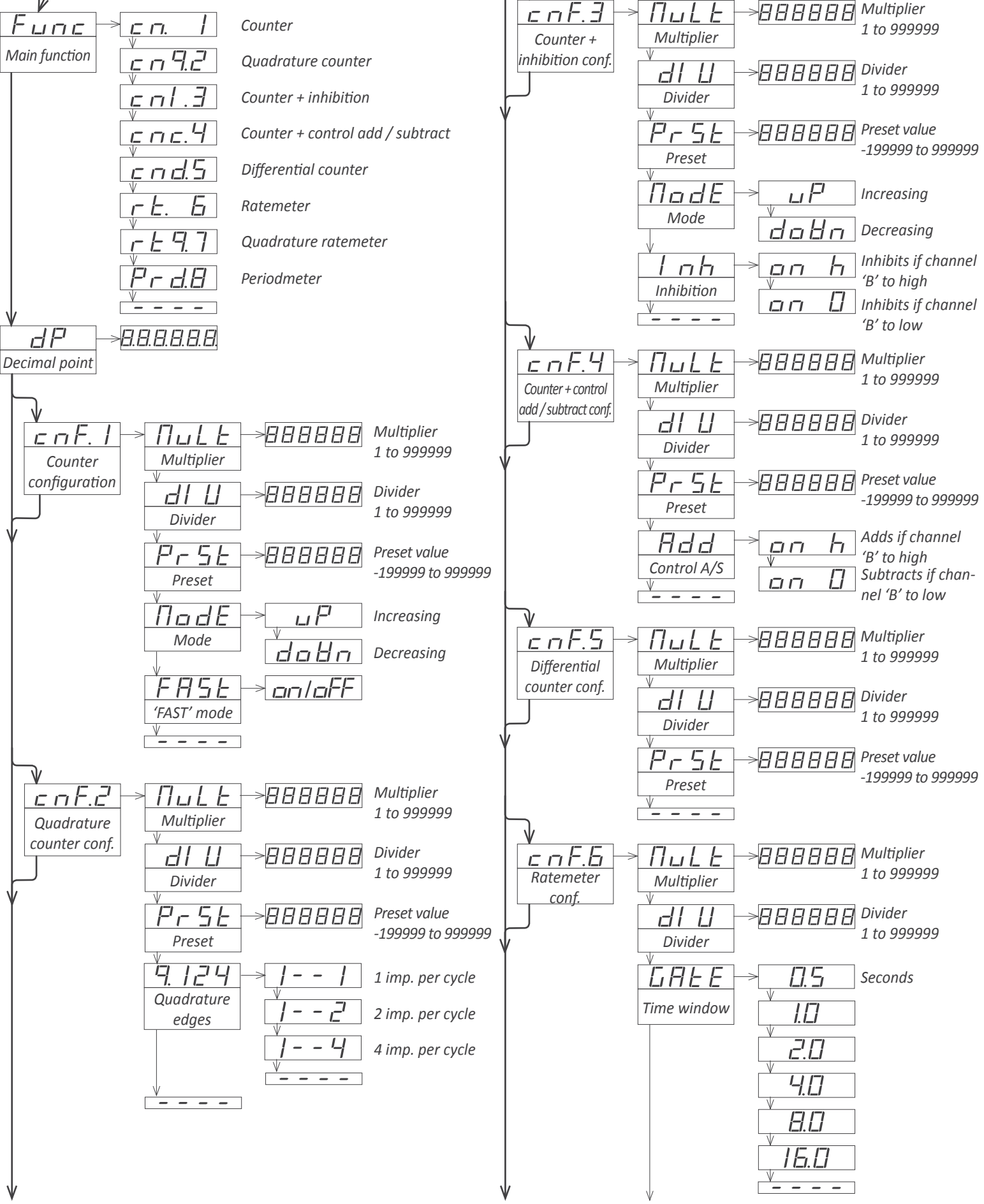
The output and control options are optional modules that can be installed at the instrument. Formats 46 and 41 have 2 free slots for output and control options, while formats 64 and 61 have 3 free slots (see section 1.4).

Several of these optional modules have their own configuration menu embedded.

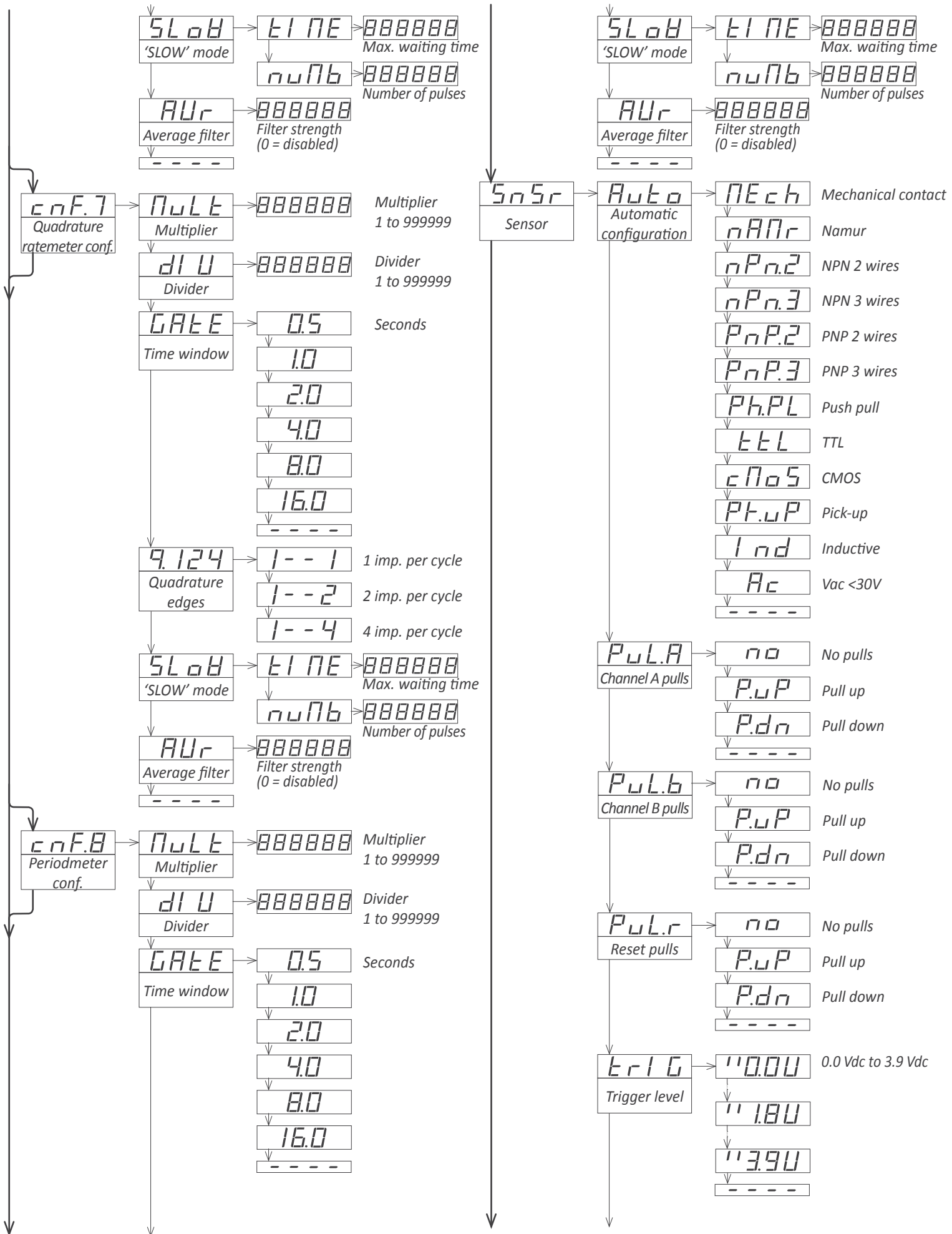
The 'Opt.1', 'Opt.2' and 'Opt.3' menu entries give access to the configuration menu of the option installed.

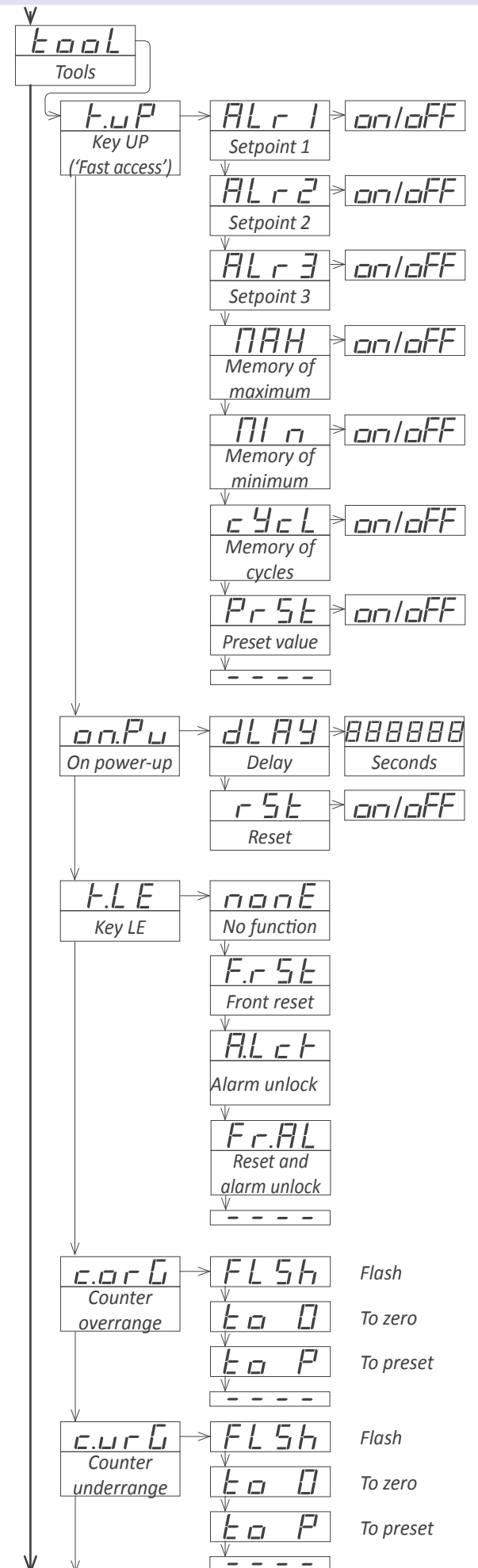
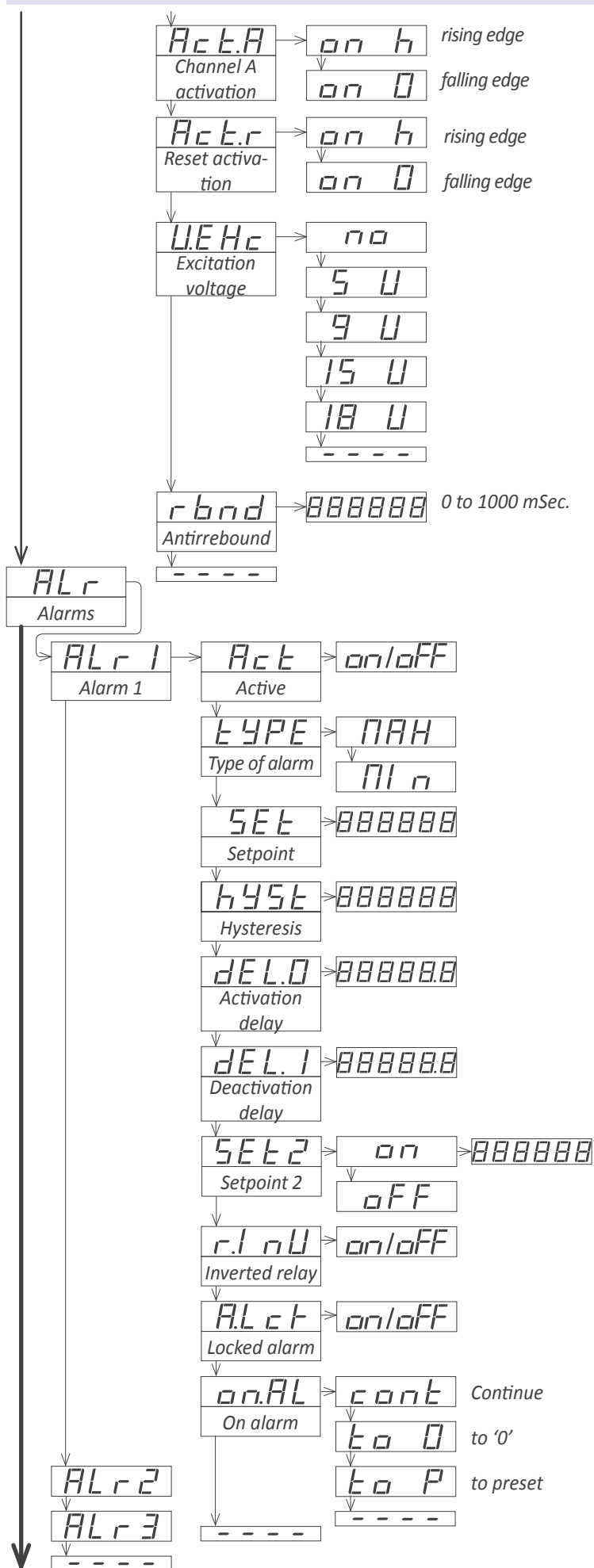
# 1.14 Full configuration menu

Press 'SQ' (■) for 1 second to access the 'Configuration menu'.

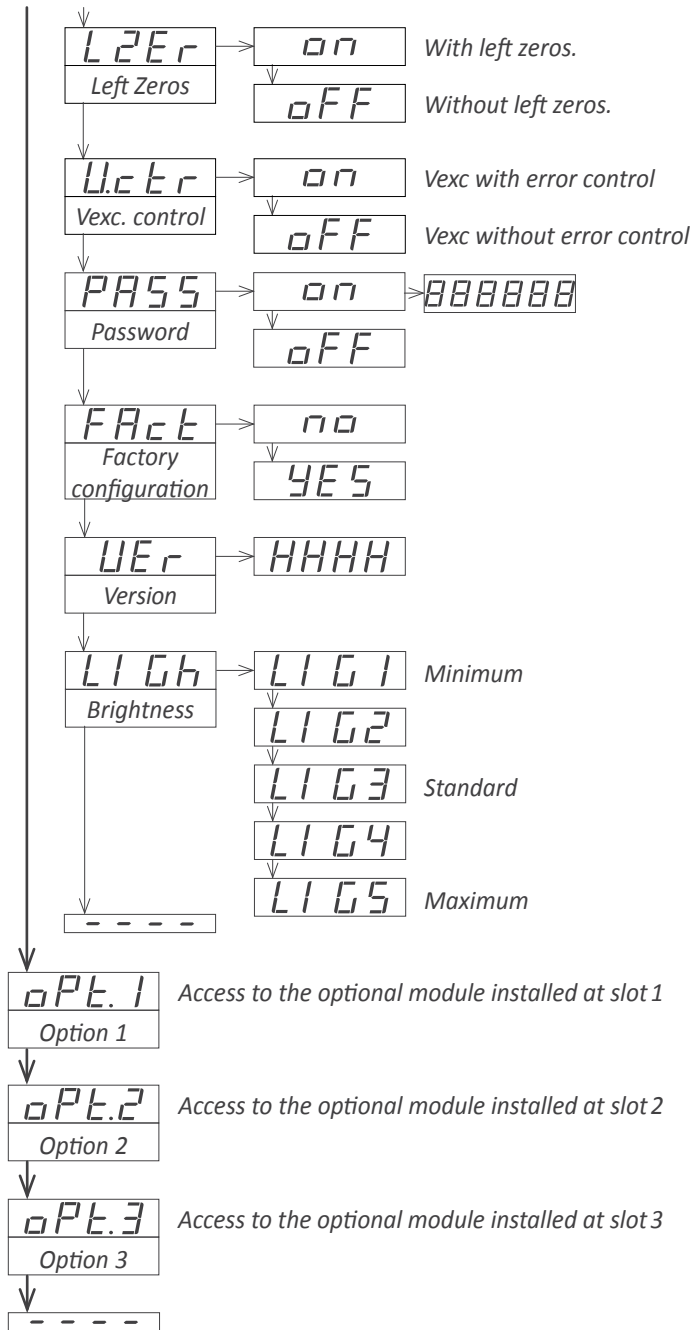








## 1.15 Factory configuration



Function	counter ('cn.1')
Decimal point	no
Counter configuration	
Multiplier	x1
Divider	/1
Preset	0
Mode	up
'FAST'	off
Sensor	
Pulls on channel A	no pull resistor
Pulls on channel B	no pull resistor
Pulls on reset	pull-up
Trigger	2,5 Vdc
Activation for channel A	on rising edge ('on_h')
Excitation voltage	5 Vdc
Antirrebound filter	0 mSeconds
Tools	
Fast access (Key UP)	off
'On Power Up'	
Delay	0 seconds
Key 'LE'	reset function
Memory of maximum	-199999
Memory of minimum	999999
Memory of cycles	0
Counter overrange	flash
Counter underrange	flash
Left zeros	off
Vexc. control	off
Password	off
Brightness	3
Alarms 1,2 and 3	
Active	off (disabled)
Type	maximum
Setpoint	1000
Hysteresis	0 counts
Activation delay	0.0 seconds
Deactivation delay	0.0 seconds
Setpoint 2	off
On Alarm	continue
Inverted relay	off
Locked alarms	off

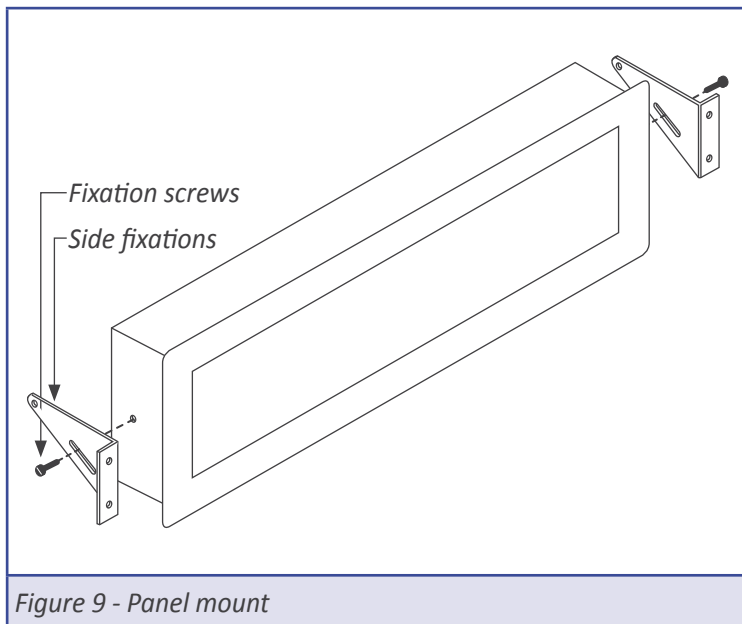
Factory configuration for Ratemeter ('cnF.6) and periodmeter ('cnF.8) modes.

Multiplier	x1
Divider	/1
Time windows	0.5
'SLOW' mode	
tIME	0 (off)
nuMb	1
Recursive filter	0 (off)

## 1.16 Mounting

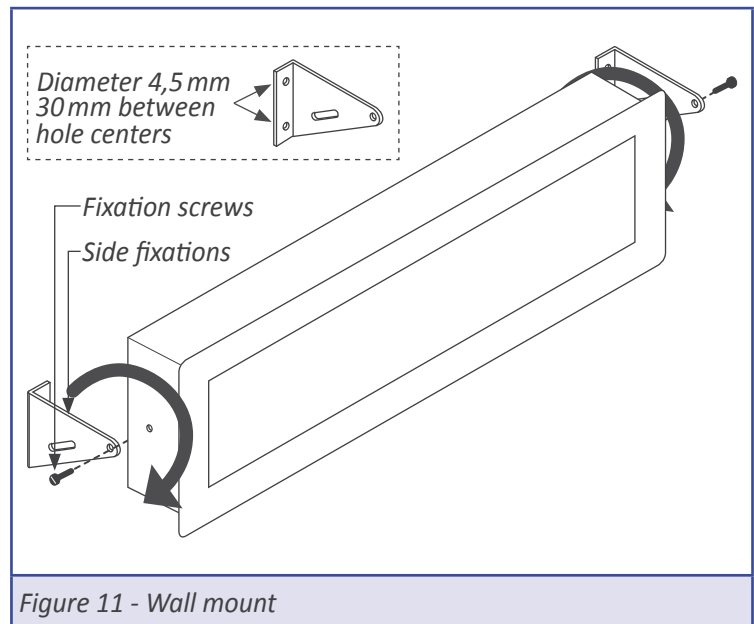
The instrument fixations are designed to allow panel mount, wall mount, or hanging mount. For each type of mounting,

- Panel mount. Apply the cut-out to the panel as seen on section 1.4. Remove the side fixations. Introduce the instrument into the panel cut-out. Mount the side fixations as shown (see Figure 9). Slightly loosen the fixation screw of one side and press the instrument against the panel. Tighten the fixation screw so it presses the panel and maintains the fixation. Repeat with the opposite side fixation.

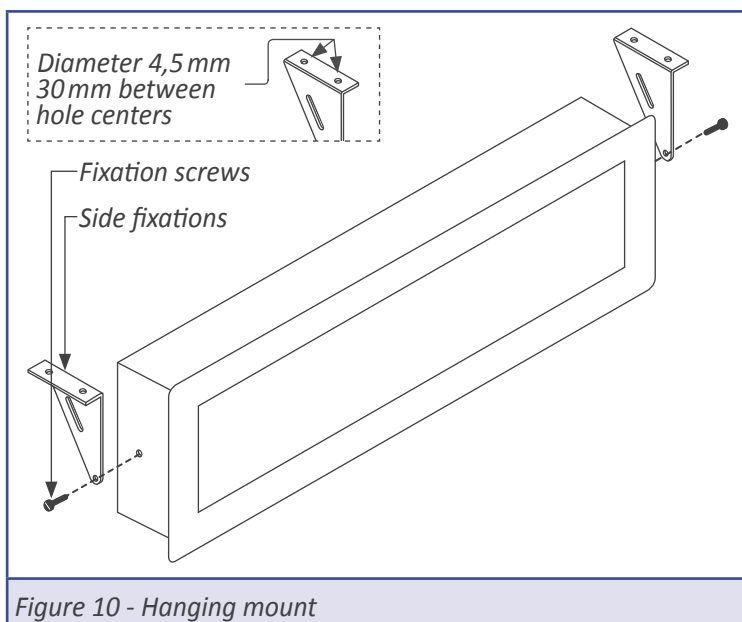


see the position of the fixations at the images below.

- Wall mount. Mount the side fixations against the wall, as shown (see Figure 11). Each fixation has 2 holes with 4,5 mm diameter and a separation between hole centers of 30 mm. Once the side fixations are secured against the wall, place the instrument and press the fixation screws slightly. Tilt the instrument to the desired viewing angle and firmly screw the fixation screws.



- Hanging mount. Mount the side fixations as shown (see Figure 10). Each fixation has 2 holes with 4,5 mm diameter and a separation between hole centers of 30 mm. Instrument can be hanged using cable, threaded rod, ....



## 1.17 Installation precautions



Risk of electrical shock. Instrument terminals can be connected to dangerous voltage.



Instrument conforms to CE rules and regulations.

This instrument has been designed and verified conforming to the 61010-1 CE security regulation, for industrial applications. Installation of this instrument must be performed by qualified personnel only. This manual contains the appropriate information for the installation. Using the instrument in ways not specified by the manufacturer may lead to a reduction of the specified protection level. Disconnect the instrument from power before starting any maintenance and / or installation action. The instrument does not have a general switch and will start operation as soon as power is connected. The instrument does not have protection fuse, the fuse must be added during installation.

An appropriate ventilation of the instrument must be assured. Do not expose the instrument to excess of humidity. Maintain clean by using a humid rag and do NOT use abrasive products such as alcohols, solvents, etc.

General recommendations for electrical installations apply, and for proper functionality we recommend : if possible, install the instrument far from electrical noise or magnetic field generators such as power relays, electrical motors, speed variators, ... If possible, do not install along the same conduits power cables (power, motor controllers, electrovalves, ...) together with signal and/or control cables.

Before proceeding to the power connection, verify that the voltage level available matches the power levels indicated in the label on the instrument.

In case of fire, disconnect the instrument from the power line, fire alarm according to local rules, disconnect the air conditioning, attack fire with carbonic snow, never with water.

## 1.18 Warranty

This instrument is warranted against all manufacturing defects for a period of 36 MONTHS from the shipment date. This warranty does not apply in case of misuse, accident or manipulation by non-authorized personnel. In case of malfunction get in contact with your local provider to arrange for repair. Within the warranty period and after examination by the manufacturer, the unit will be repaired or substituted when found to be defective. The scope of this warranty is limited to the repair cost of the instrument, not being the manufacturer eligible for responsibility on additional damages or costs.

## 1.19 CE declaration of conformity

Manufacturer PCE INSTRUMENTS

Products PCE-BPD-P

The manufacturer declares that the instruments indicated comply with the directives and rules indicated below.

Electromagnetic compatibility directive 2014/30/EU

Low voltage directive 2014/65/EU

Directive ROHS 2011/65/EU

Directive WEEE 2012/19/EU

### Security rules EN-61010-1:2010

Instrument Fixed, Permanently connected

Pollution degree 1 and 2 (without condensation)

Isolation Basic + Protective union

### Electromagnetic compatibility rules EN-61326-1:2013

EM environment Industrial

#### Immunity levels

EN-61000-4-2 By contact  $\pm 4$  KV Criteria B  
By air  $\pm 8$  KV Criteria B

EN-61000-4-3 Criteria A

EN-61000-4-4 On AC power lines:  $\pm 2$  KV Criteria B  
On DC power lines:  $\pm 2$  KV Criteria B  
On signal lines :  $\pm 1$  KV Criteria B

EN-61000-4-5 Between AC power lines  $\pm 1$  KV Criteria B  
Between AC power lines and earth  $\pm 2$  KV Criteria B  
Between DC power lines  $\pm 1$  KV Criteria B  
Between DC power lines and earth  $\pm 2$  KV Criteria B  
Between signal lines and earth  $\pm 1$  KV Criteria B

EN-61000-4-6 Criteria A

EN-61000-4-8 30 A/m at 50/60 Hz Criteria A

EN-61000-4-11 0 % 1 cycle Criteria A  
40 % 10 cycles Criteria A  
70 % 25 cycles Criteria B  
0 % 250 cycles Criteria B

#### Emission levels

CISPR 11 Instrument Class A, Group 1 Criteria A



According to directive 2012/19/EU, electronic equipment must be recycled in a selective and controlled way at the end of its useful life.

## 2. Other options and accessories

### 3.1 PCE-BPD-RK Remote keypad

Remote keypad for big panel displays. Replicates a remote version of the front keypad, close to the operator.

(\*Cable not provided).







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